V20 SCANNER
SERVICE MANUAL

17 July, 1997

Subject to change.

⚠IMPORTANT SAFETY NOTICE

1. Before disassembling or assembling parts of the scanner and peripherals, make sure that the scanner power cord is unplugged.
2. The wall outlet should be near the scanner and easily accessible.
3. The output voltage of the PSU (Power Supply Unit) can be either 100 ~ 120 Vac or 220 ~ 240 Vac, without any adjustment. Make sure that the above voltage is used.
4. The power cord should be an approved type, in accordance with the regulations for the country in which the scanner is used.
5. The use of cables other than the shield I/O cables or equivalent specified will invalidate the certification of this scanner and may cause interference levels which exceed the limits established for this equipment.

Maintenance Information

The user's manual explains how to use and maintain the scanner. Before performing the maintenance, read the user's manual.

Warning concerning copyright

Many documents are copyrighted. Such documents may not be reproduced by scanning or in any other form without the express permission of the copyright holder.

Notice

The contents of this manual are subject to change without notice.

1. OVERALL MACHINE INFORMATION

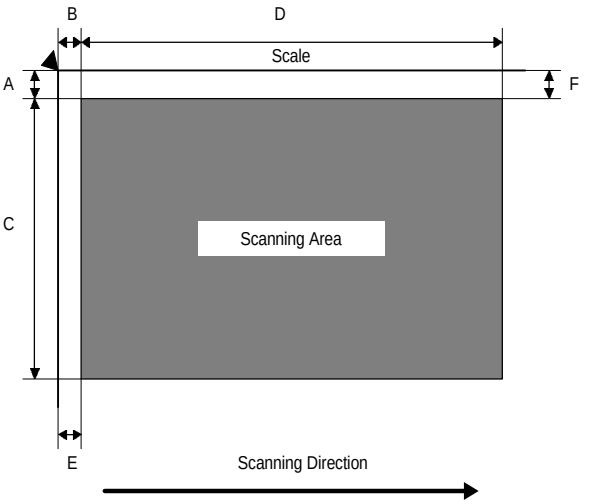
1.1 SPECIFICATIONS

Scanning Method:	Flat-bed with ADF
Document size:	ADF: - Width: 105~297 mm [4.1~11.7 ins] - Length: 128~1260 mm [5.0~49.6 ins] All pages in a document must be the same width Document weight: 52.3 ~ 104.7 g/m^2 [14 ~ 27.7 lb.] ADF capacity: 30 sheets [80 g/m^2]
Scanning output resolution:	Book scan: Main scan and Sub scan: 60, 75, 100 ~ 800 dpi ADF: Main scan and Sub scan: 60, 75, 100 ~ 600 dpi
Gray scale:	4, 8 bits/pixel
Initialization time:	About 15 seconds
Scanning speed:	1.65 s / 200 dpi (A4 short-edge, binary picture mode) 2.33 s / 200 dpi (A3, binary picture mode)
Scanning throughput (ADF mode):	24 ppm / 200 dpi (A4 short-edge, binary picture mode) 12 ppm / 400 dpi (A4 short-edge, binary picture mode) Note: Counted from the second page.
Interface:	SCSI-2
Power:	100 ~ 120V ac 50/60 Hz 220 ~ 240V ac 50/60 Hz
Power consumption:	Standby: 27 W Max. Scanning: 72 W Max.
Operating environment:	Temperature: 10 ~ 32 °C [50 ~ 90 °F] Humidity: 20 ~ 80 %RH
Weight:	Less than 28 kg [61.7 lbs.]
Dimensions (W x D x H):	550 x 500 x 300 mm [21.7 x 19.7 x 11.8 ins]

Scanning Specifications

- Book Mode -

Registration:	A: 1 ± 1 mm
	B: 1 ± 1 mm
Scanning area:	- Guaranteed -
	C: 297 mm
	D: 432 mm
	- Maximum -
	C: 307 mm (< 410 dpi) or 4960 dots (> 410 dpi)
	D: 432 mm
Skew:	Leading edge
	100 x (B - E) / C = ± 1%
	Side edge
	100 x (A - F) / C = ± 1%



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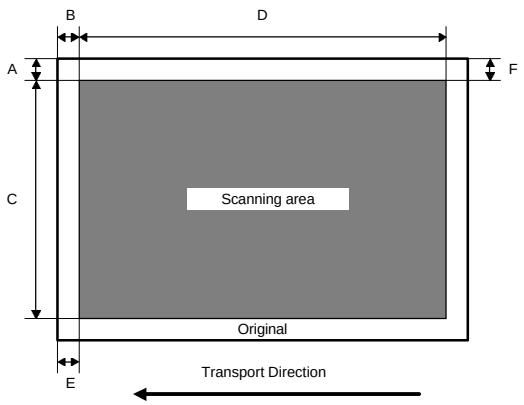
- ADF Mode -

Registration:	A: 1 ± 3 mm
	B: 1 ± 3 mm
Scanning area:	- Guaranteed -
	C: 297 mm
	D: 1260 mm
	- Maximum -
	C: 298 mm (< 422 dpi) or 4960 dots (> 422 dpi)
	D: 1260 mm
Skew:	Leading edge
	100 x (B - E) / C =
	Side edge



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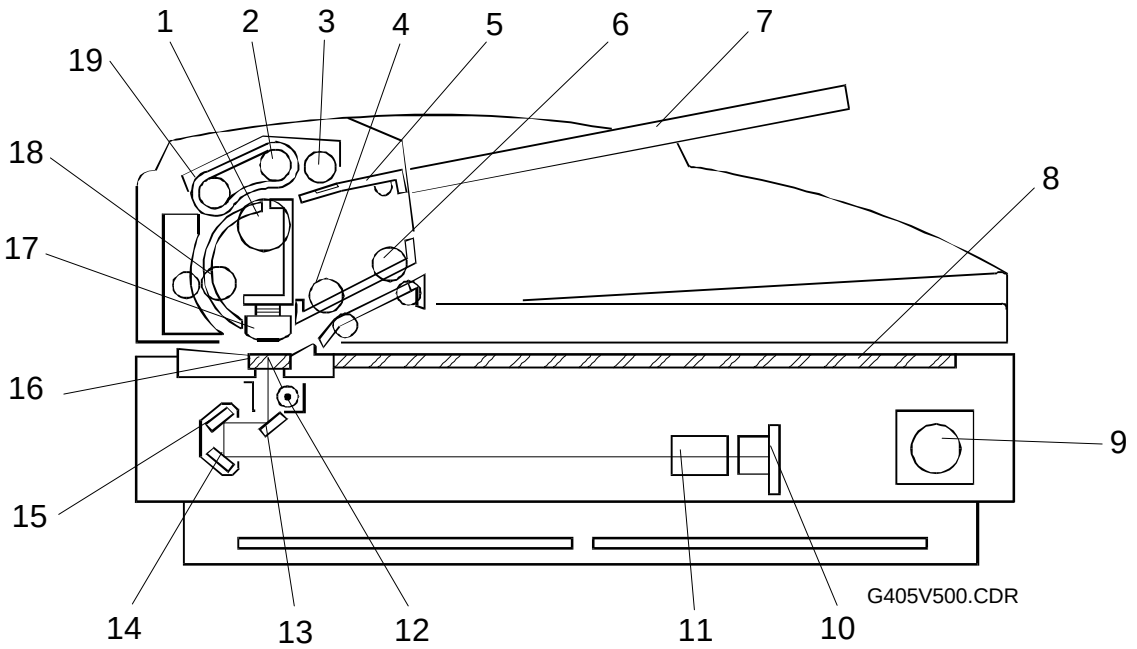
100 x (A - F) / C =
< A4, LT: ± 2.3%
= A4, LT: ± 1.8%
> A4, LT: ± 1.5%

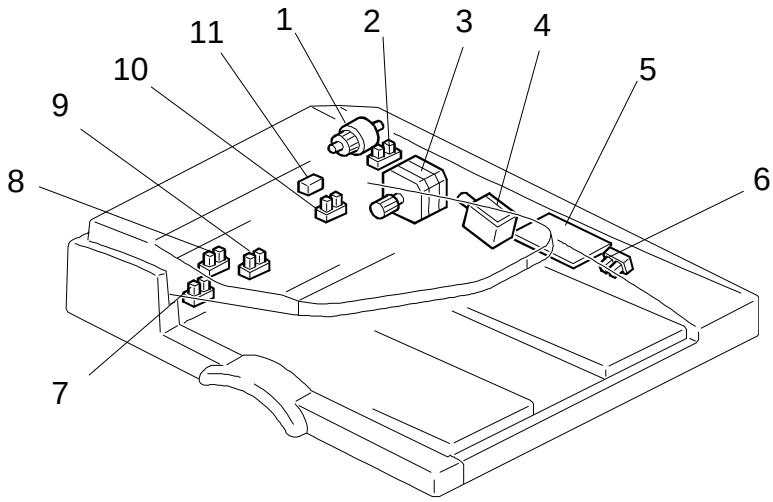
1.2 COMPONENT LAYOUT

1.2.1 MECHANICAL COMPONENT LAYOUT



1. Separation Roller
2. Paper Feed Roller
3. Pick-up Roller
4. 2nd Transport Roller
5. Original Entrance Guide
6. Original Exit Roller
7. Original Table
8. Exposure Glass
9. Scanner Motor
10. SBU (Sensor Board Unit) Board
11. Lens
12. Xenon Lamp
13. 1st Mirror
14. 3rd Mirror
15. 2nd Mirror
16. DF Exposure Glass
17. Original Exposure Guide
18. 1st Transport Roller
19. Original Feed Belt

1.3 ELECTRICAL COMPONENT LAYOUT



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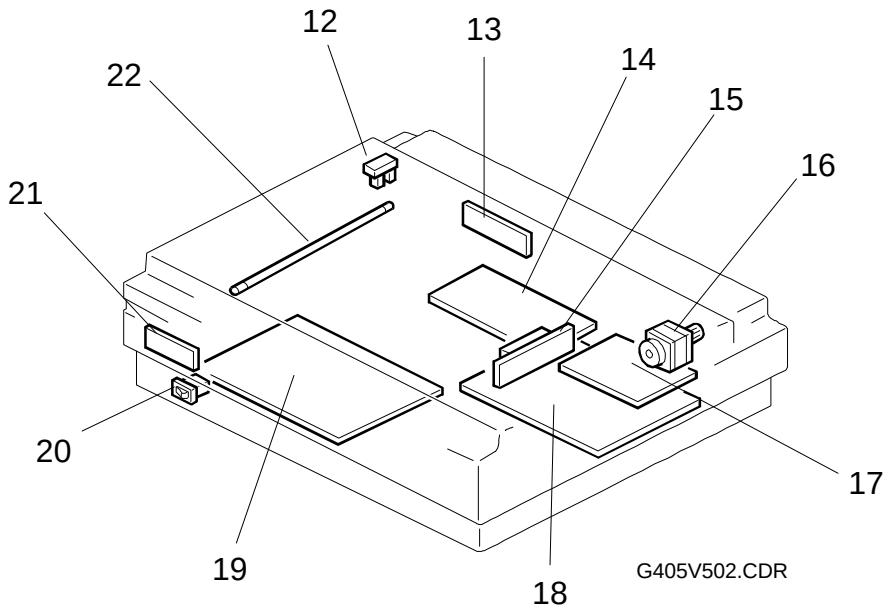

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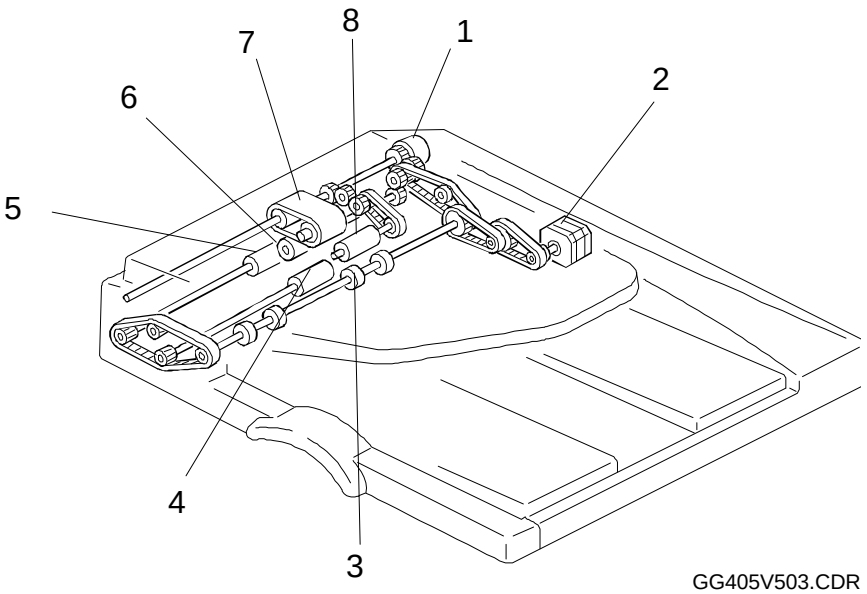
1. DF Feed Clutch
2. Feed Cover Open Sensor
3. DF Feed Motor
4. DF Pick-up Solenoid
5. DF Drive PCB
6. DF Position Sensor
7. Original Width Sensor 3
8. Original Width Sensor 2
9. Original Width Sensor 1
10. Original Set Sensor
11. Registration Sensor
12. Scanner H.P Sensor
13. Lamp Stabilizer
14. SIU (SCSI Interface Unit)
15. SBU (Sensor Board Unit)
16. Scanner Motor
17. IPU (Image Processing Unit) - Option
18. SCU (Scanner Control Unit)
19. PSU (Power Supply Unit)
20. Main Switch
21. Indicator Panel
22. Xenon Lamp

1.4 ELECTRICAL COMPONENT DESCRIPTIONS

Symbol	Index No.	Description	Note
Printed Circuit Board			
PCB 1	18	SCU	Controls the overall scanner function.
PCB 2	14	SIU	This contains the SCSI controller.
PCB 3	19	PSU	Provides dc voltages to the system.
PCB 4	15	SBU	Contains the CCD, and outputs a video signal to the SCU board.
PCB 5	5	DF Drive	Interfaces the electrical signals from the ADF and the SCU board.
PCB 6	13	Lamp Stabilizer	Provides dc power for the xenon lamp.
PCB 7	21	Indicator Panel	This contains the scanner indicator lamps.
PCB 8	17	IPU (Option)	Performs automatic text/image separation and dynamic thresholding
Motors			
M 1	3	DF	Drives all DF rollers.
M 2	16	Scanner	Drives the scanners.
Sensors			
S 1	2	Feed Cover Open	Detects whether the feed-in cover is opened or not.
S 2	6	DF Position	Detects whether the DF is lifted or not.
S 3	9	Original Width 1	Detects the original width.
S 4	8	Original Width 2	Detects the original width.
S 5	7	Original Width 3	Detects the original width.
S 6	10	Original Set	Detects if an original is on the feed table.
S 7	11	Registration	Detects the original exposure timing, and checks for original misfeeds.
S 8	12	Scanner H.P Sensor	Informs the CPU when the 1st and 2nd scanners are at the home position.
Switches			
SW 1	20	Main	Supplies power to the scanner.
Magnetic Clutches			
CL 1	1	DF Feed	Transfers DF motor drive to the pick-up roller and feed belt.
Solenoids			
SOL 1	4	DF Pick-up	Controls the up-down movement of the original table.
Lamps			
L 1	22	Xenon	Applies light to the original for exposure.

1.5 DRIVE LAYOUT



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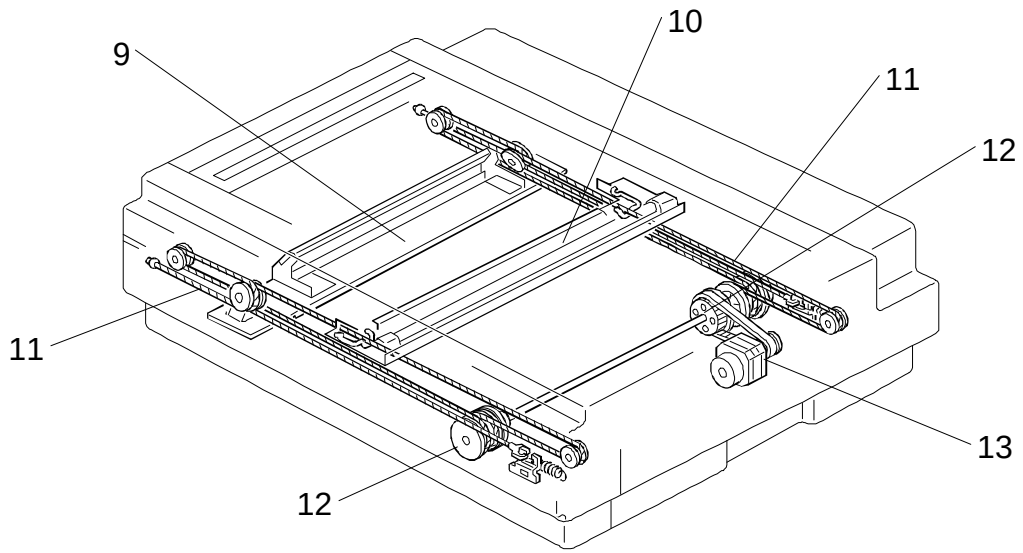

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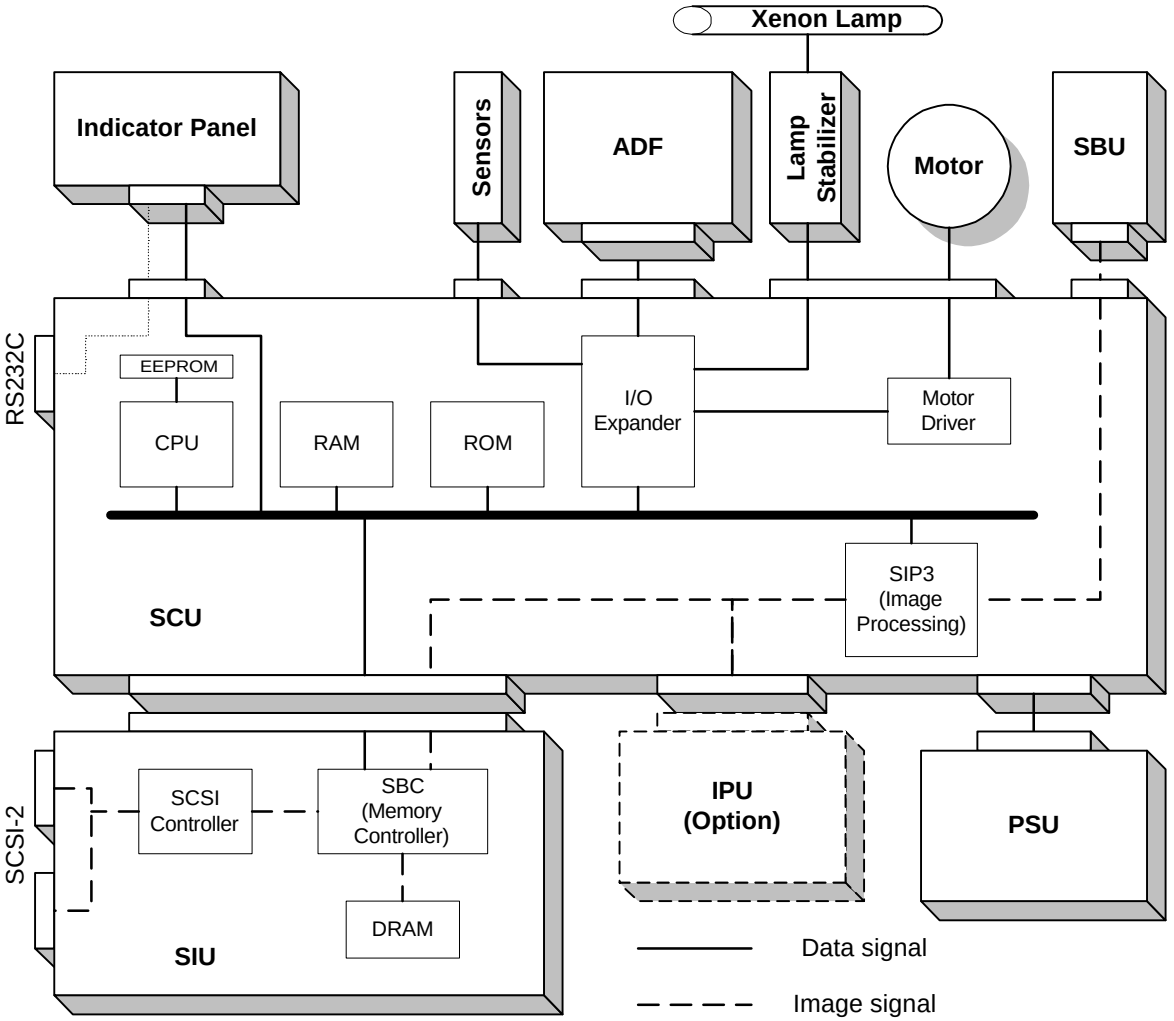
1. DF Feed Clutch
2. DF Feed Motor
3. Exit Roller
4. 2nd Transport Roller
5. 1st Transport Roller
6. Separation Roller
7. Original Feed Belt
8. Pick-up Roller
9. 2nd Scanner
10. 1st Scanner
11. Scanner Wire
12. Scanner Drive Pulley
13. Scanner Motor

1.6 BOARD STRUCTURE

1.6.1 OVERVIEW



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1.6.2 DESCRIPTION

1. SCU (Scanner Control Unit)

This is the main control board. It controls the following functions:

- Scanner control, system control
- Image processing, video control
- RS232C interface for future use

2. SIU (SCSI Interface Unit)

This board contains the SCSI controller and the memory controller. This board interfaces the scanner to a host computer.

3. SBU *Sensor Board Unit)

The SBU receives the analog signals from the CCD and converts them into digital signals.

4. PSU (Power Supply Unit)

This provides +5V, +24V, and ±12V dc to the scanner.

5. Indicator Panel

This indicates the scanner condition using four LEDs.

6. IPU (Image Processing Unit) - Optional equipment

This board performs automatic image/text separation and dynamic thresholding.

2. DETAILED SECTION DESCRIPTIONS

2.1 INITIALIZATION

During power-up initialization, the machine initializes the PCBs, flatbed scanner mechanism, and ADF mechanism, to detect errors.

The errors which can be detected during initialization are as follows:

1. Memory Error
2. Scanner Home Position Error
3. Jams in the ADF

Refer to section 7 for more information about these errors.

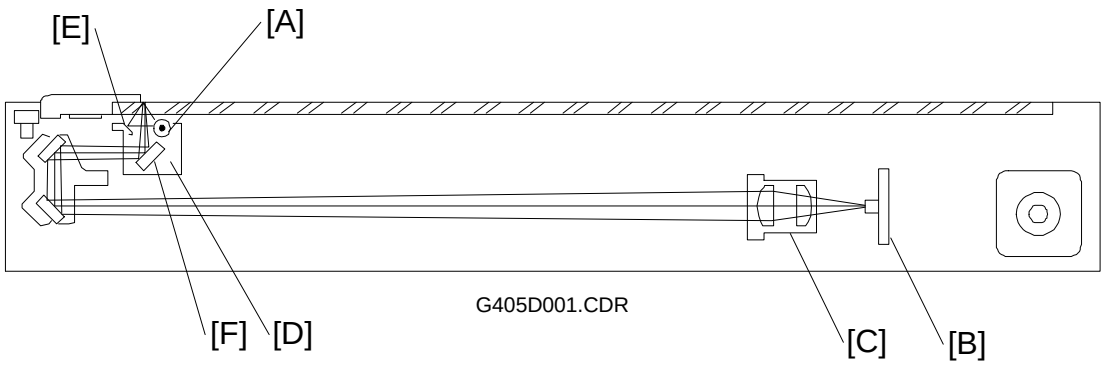
2.2 BOOK MODE

2.2.1 OVERVIEW

When the machine receives the book mode scan command from a host computer, it initializes the shading data (by scanning the white sheet between the main exposure glass and the DF exposure glass) and sets the video processing parameters as requested by the host computer. Then, the machine scans the specified area, and transfers the scanned data to the host computer. After scanning an original, the 1st and 2nd scanners move back to the home position.

If the machine receives an ABORT command while scanning an original, the machine stops scanning and moves the 1st and 2nd scanners to the home position.

2.2.2 SCANNER OPTICS



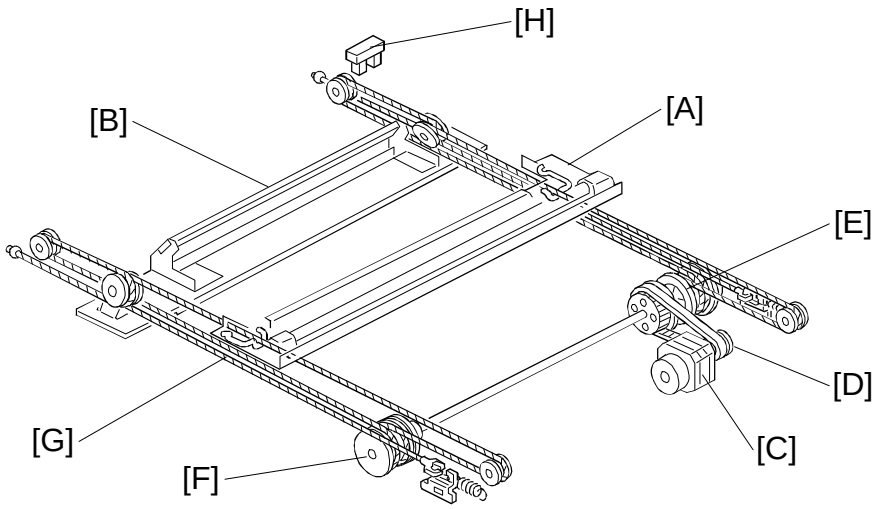
The original is illuminated by the exposure lamp (a xenon lamp in this model) [A]. The image is reflected onto a CCD (charge coupled device) [B] via the 1st, 2nd, 3rd mirrors, and lens [C].

The 1st scanner [D] consists of the exposure lamp, a reflector [E], and the 1st mirror [F].

The exposure lamp is energized by a dc supply to avoid uneven light intensity as the 1st scanner moves in the sub scan direction. The entire exposure lamp surface is frosted to ensure even exposure in the main scan direction.

The light reflected by the reflector is of almost equal intensity, to reduce shadows on pasted originals.

2.2.3 DRIVE MECHANISM



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A stepper motor is used to drive the scanner. The 1st and 2nd scanners [A,B] are driven by this scanner drive motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

The scanner drive board controls and operates the scanner drive motor. The drive speed of the 1st scanner is different for each scanning mode. (Maximum scanning speed: 180 mm/s) The 2nd scanner speed is half that of the 1st scanner. The returning speed is always the same (360 mm/s). The resolution change in the sub scan direction is done by changing the scanner drive motor speed, and in the main scan direction it is done by image processing on the SCU board.

2.2.4 ERROR CONDITIONS

The machine detects the following errors in book mode scanning.

Error	Condition
Lamp error	The CPU does not detect the specified output level of the CCD while scanning the white plate.
Scanner home position error	The CPU does not detect the signal change of the home position sensor [H] within the specified period while moving the 1st scanner back and forth.

Refer to section 7 for more information about these errors.

2.3 ADF MODE

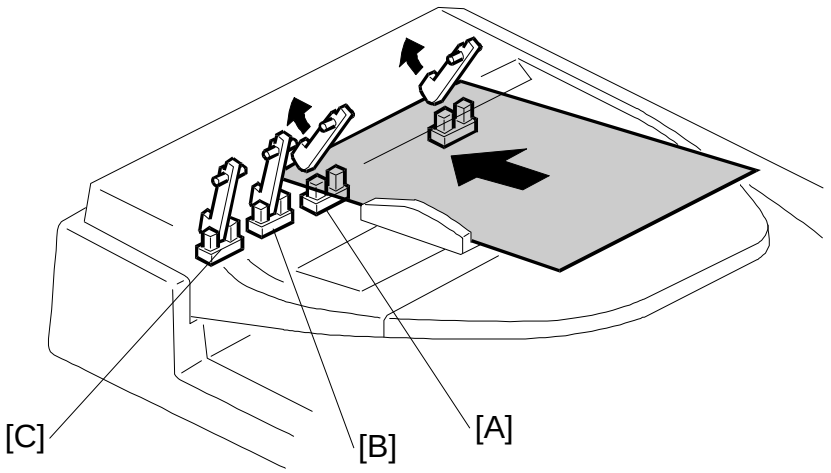
2.3.1 OVERVIEW

When the machine is requested to scan originals using the ADF (Automatic Document Feeder), if an original is placed in the ADF, it initializes the shading data (by scanning the white sheet attached to the back of the DF exposure glass assembly) and sets the video processing parameters as requested by the host computer.

Then, the machine moves the 1st scanner to the home position, and scans the original by feeding it through the scan position.

When the machine receives an ABORT or UNLOAD command while scanning, the machine stops scanning and feeds out the original being scanned.

2.3.2 ORIGINAL WIDTH DETECTION (AVAILABLE IN ADF MODE ONLY)



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The ADF has three width sensors (- 1 [A], - 2 [B], and - 3[C]) to detect the original width. The machine detects the original width from the combination of outputs from those three sensors.

If the scanner receives the command to send the document width, it sends the document width data in accordance with the document width sensors' signals. The relation between the document size, sensors' signals, and the width data is shown in the table below.

Note that the width data depends on the setting of dip switch 3.

If the switch is ON, the scanner recognizes that an original of a European size has been set.

If the switch is OFF, the scanner recognizes that an original of an American size has been set.

Document Size	Width Sensor			Width Data (mm)	
	1	2	3	DIP SW3 OFF	DIP SW3 ON
A3 (Lengthwise), A4 (Sideways), 11” x 17”, 11” x 15”, 11” x 8.5”	L	L	L	280	297
B4 (Lengthwise), B5 (Sideways), 10” x 14”	L	L	H	257	257
A4 (Lengthwise), A5 (Sideways), 8.5” x 11”, 8.5” x 14”, 8” x 13”, 8.5” x 13”, 8.5” x 5.5”	L	H	H	216	210
B5 (Lengthwise), B6 (Lengthwise), B6 (Sideways), A5 (Lengthwise), 5.5” x 8.5”	H	H	H	140	148

L: Activated, H: Deactivated

2.3.3 PICK-UP AND SEPARATION

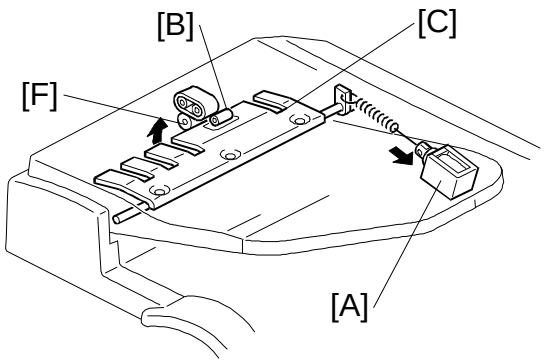
- ADF Mode -

When the machine receives a scan request from a host computer, the machine starts feeding the original (if it has been placed on the original table. If an original is not present, the machine returns an error to the host computer.

- SADF Mode (also known as Medium Wait mode) -

When the machine receives a scan request from a host computer, the machine waits for an original to be placed on the original table. If the original is placed on the table within the specified time, the machine starts feeding.

- Mechanism -



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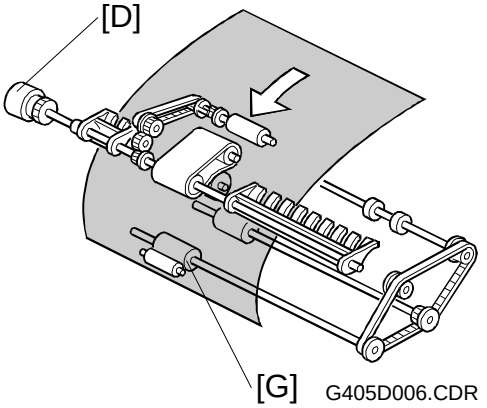

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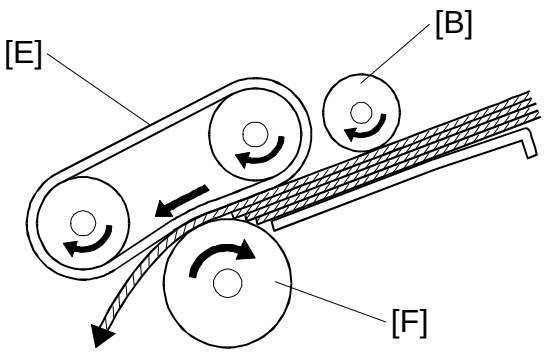

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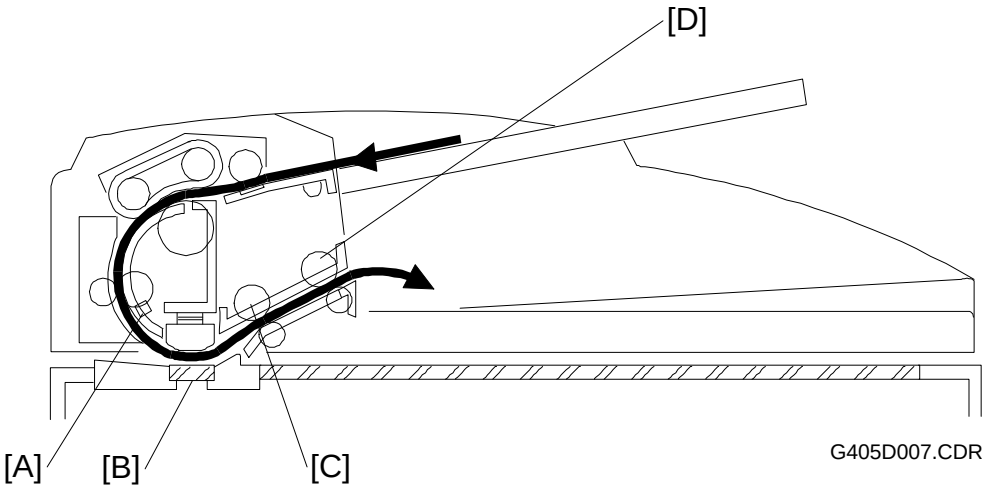
When the machine receives the ADF scan command, the DF pick-up solenoid [A] turns on and the originals are lifted up to the pick-up roller [B] by the entrance guide [C]. At the same time, the DF feed clutch [D] turns on.

At 300 ms after this, the DF feed motor turns on. The original is fed to the paper feed belt [E] from the top page. The pages of the original are separated using an FRR system by the separation roller [F], and the top sheet of the original is fed to the 1st transport roller [G] at the maximum speed of the ADF (257 mm/s).

2.3.4 ORIGINAL TRANSPORT, SCANNING, AND EXIT MECHANISM



When the leading edge of the original reaches the registration sensor [A], the DF feed motor turns off. Then the scanner changes the document feed speed setting depending on the scanning resolution (e.g. 180 mm/s for 200 dpi). Then, the motor turns on again.

The machine starts scanning when the leading edge of the specified scanning area reaches the ADF scanning position [B] which is just over the home position of the 1st scanner. The machine scans each main scanning line while feeding the document. The maximum output resolution in ADF mode is 600 dpi in both main and sub scan directions, while in the book mode it is 800 dpi.

The document is fed through the 2nd transport roller [C] and fed out by the exit roller [D]. If the scanner continues to scan the next page on the document table, the scanner repeats the image scanning steps.

When a page is fed out, the next page has been already fed into the scanner. However, the feed belt is slower than the transport rollers, so there is a gap between the pages.

2.3.5 LENGTH DETECTION (AVAILABLE IN ADF MODE ONLY)

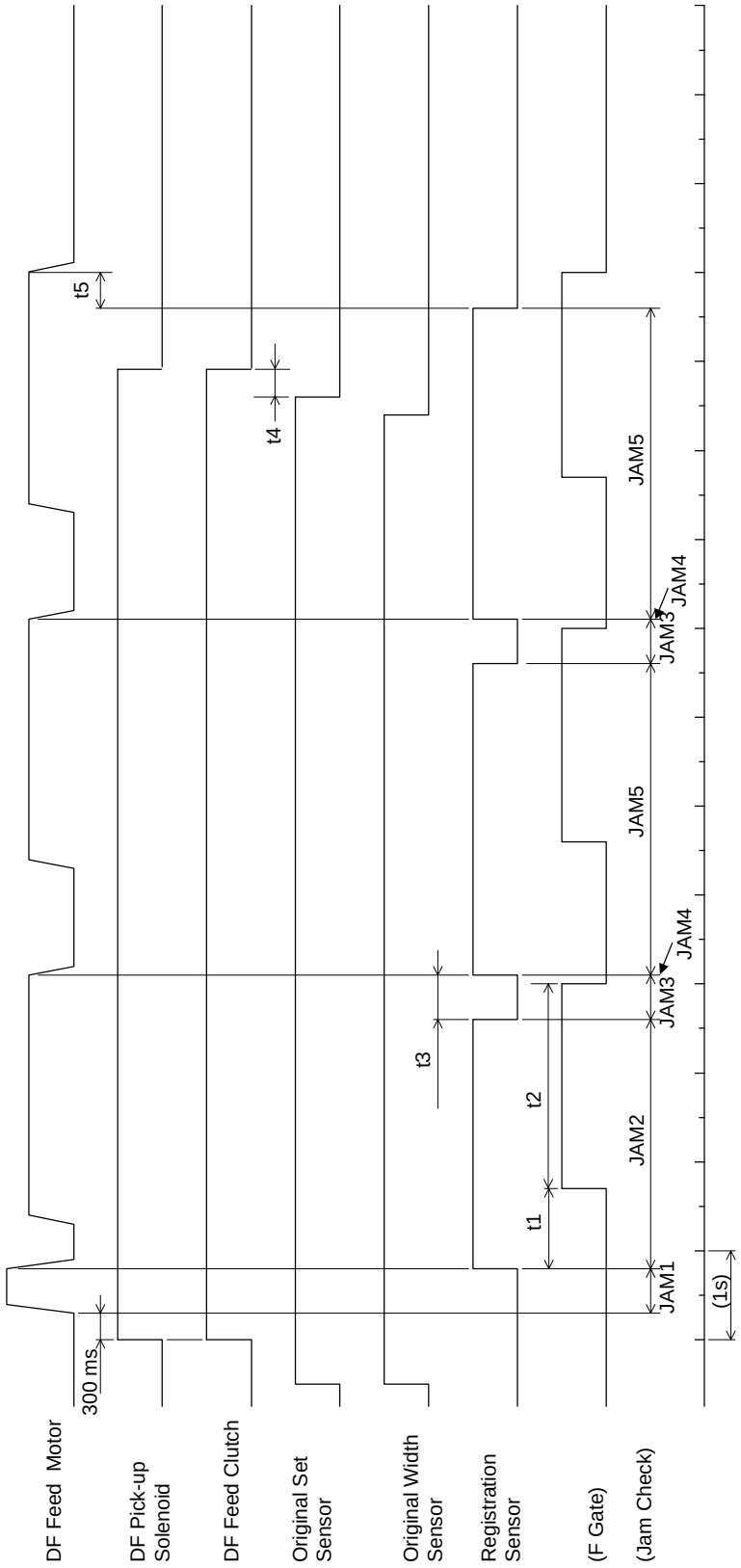
If the scanner receives a command to send the document length, after finishing scanning it sends the length that was specified by the Set Window command (used to specify the scan area). However, if the document is shorter than the scanning length specified by the Set Window command, the scanner sends the document length calculated by counting the document feed motor pulses while the registration sensor was on during scanning.

2.3.6 ERROR CONDITIONS

The machine detects the following errors in ADF mode scanning.

Error	Condition
Lamp error	The CPU does not detect the specified output level of the CCD while scanning the white plate.
Scanner home position error	The CPU does not detect the signal change of the home position sensor within the specified period while moving the 1st scanner back and forth.
ADF lifted up ADF cover open	The CPU detects the error using the cover open and feed cover open sensor signals. The LED indication is the same in both conditions.
Original misfeed	Refer to the next section.
Original jam	Refer to the next section.

2.3.7 TIMING CHART



F Gate: Indicates effective data length in sub scan direction.

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2.3.8 JAM DETECTION

J1: The leading edge of the 1st page did not reach the registration sensor within 3 s after the DF feed motor turned on. The machine indicates a misfeed condition.

J2: The trailing edge of the 1st page did not pass through the registration sensor within the time required for feeding 1,290 mm. The machine indicates a jam condition.

J3: The leading edge of the 2nd (or later) page did not reach the registration sensor within the time required for feeding 200 mm. The machine indicates a misfeed condition.

J4: The leading edge of the page reached the registration sensor before the FGATE signal (which indicates that scanning is in progress) for the previous page turns off. The machine indicates a jam condition.

J5: If the length of the 1st page is more than 432 mm:
The trailing edge of the 2nd (or later) page did not pass through the registration sensor within the time required for feeding the length of the 1st page + 30 mm.

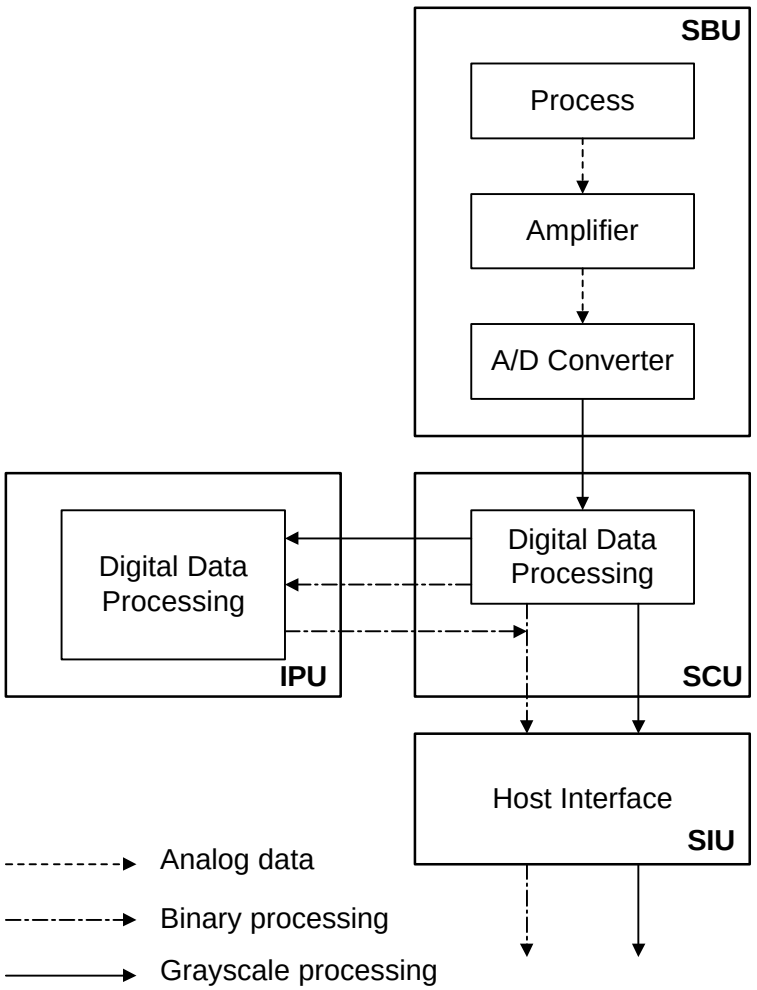
If the length of the 1st page is not more than 432 mm:
The trailing edge of the 2nd (or later) page did not pass through the registration sensor within the time required for feeding 462 mm.

The machine indicates a jam condition.

Time limits (see the timing chart on the previous page)

Example Modes	t1 (s)	t2 (s)	t3 (s)	t4 (s)	t5 (s)
200 dpi A4 Lengthwise Binary picture	0.28	1.65 - 1.68	0.23 - 0.31	0 - 0.09	0.81
400 dpi A3 Lengthwise Binary picture	0.42	4.67 - 4.72	0.46 - 0.61	0 - 0.18	1.63
600 dpi A4 Sideways Grayscale	0.54	3.50 - 3.59	0.70 - 0.92	0 - 0.27	2.44

2.4 VIDEO PROCESSING



2.4.1 SBU (SENSOR BOARD UNIT)

The CCD on the SBU converts the light reflected from the original into an analog signal. The analog signals are amplified, and converted to 8-bit digital signals by the A/D converter on the SBU. This will give a value for each pixel on a scale of 256 grades. Then, the digitized image data goes to the SCU board.

2.4.2 SCU (SCANNER CONTROL UNIT)

The image data sent from the SBU goes to the SIP3 (Scanner Imaging Peripheral 3) on the SCU board, which processes the image data in accordance with the parameters set by the command from the host computer. Then the SCU sends the data (binary or grayscale) to the SIU (SCSI Interface Unit).

2.4.3 IPU (IMAGE PROCESSING UNIT) - OPTIONAL

The IPU gives the following additional functions.

- Automatic Photo/Text Separation
- Dynamic Thresholding

When the machine receives the command which specifies use of one of the above functions, the IPU receives both the grayscale and the binary data from the SCU. The IPU processes the data and outputs the final binary data to the SCU.

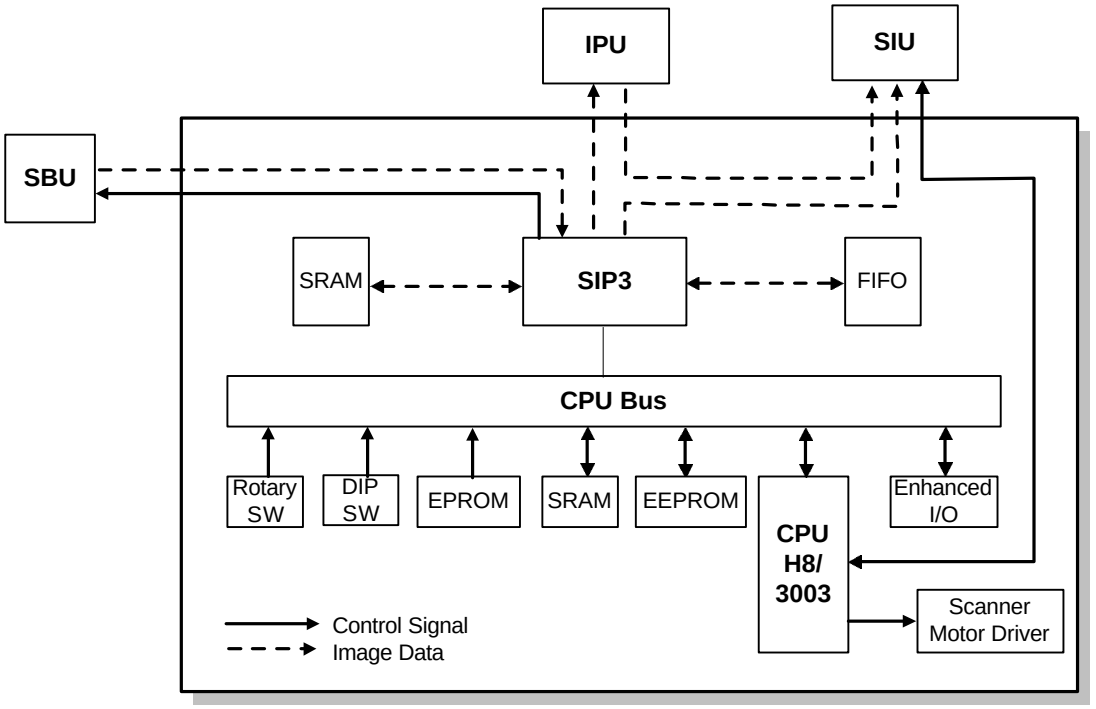
Refer to section 8 for more information about the IPU.

2.4.4 SIU (SCSI INTERFACE UNIT)

The data sent from the SCU goes into the buffer memory (DRAM) on the SIU. The SIU outputs the data to the host computer while handshaking with it. This machine uses a SCSI controller which conforms to SCSI-2. The data transfer speed is 5 Mbytes/s (asynchronous transfer) or 10 Mbytes/s (synchronous transfer).

2.5 PCBS AND THEIR FUNCTIONS

2.5.1 SCU (SCANNER CONTROL UNIT)



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The major functions of the SCU are:

1) Image data processing
2) Sequential control
3) Interface unit (SIU) control
4) Optional unit (IPU) control

The major components on the SCU are:

CPU

- Hitachi HD6413003FR-12 (H8/3003)

SIP3 (Scanner Imaging Peripheral 3)

- Generates the basic drive clock for the CCD
- Shading correction
- Image processing
- The connected FIFO (5 kbits x 8) is used for line memory
- The connected SRAM (64 kbits) is used for image data buffer

SRAM

- Work area (256 kbits)

EPROM

- Includes the firmware (256 kbits)

Enhanced I/O

- Extension for the I/O port
- A push switch (mode enable button), scanner display LEDs, home position sensor, and DF drive PCB are connected

EEPROM

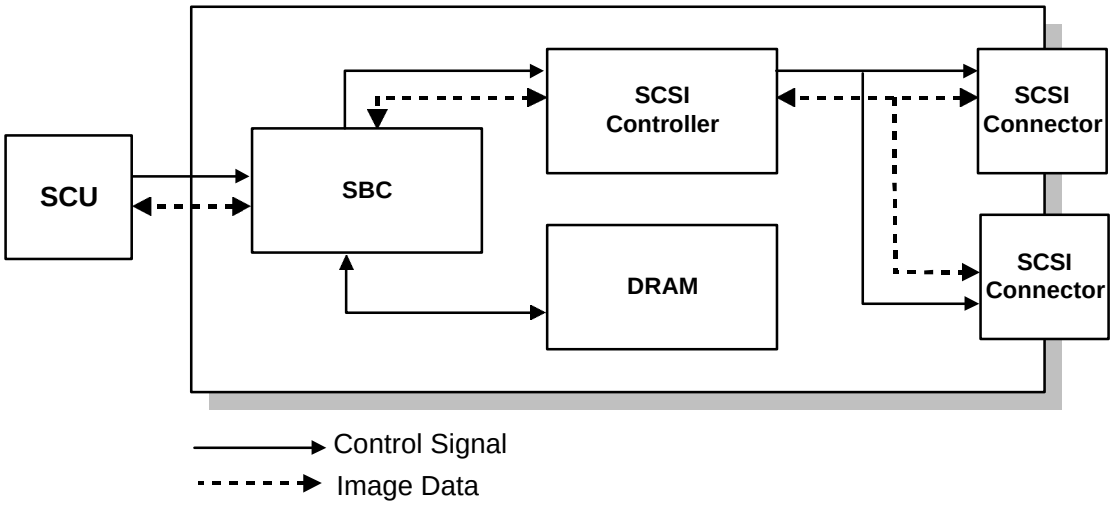
- Holds the book, ADF, and lamp on time counter values (1k bits)
- Holds the image registration values

If the SCU is changed, the EEPROM from the old SCU must be removed and put on the new SCU.

Scanner Motor Driver

- Drives the scanner motor

2.5.2 SIU (SCSI INTERFACE UNIT)



G405D011.VSD

The functions of the SIU are:

1) SCSI interface control
2) Buffer memory control
3) Supplies terminator power to the other connected SCSI devices

The major components on the SIU are:

SBC (Scan Buffer Controller)

- Stores the image data from the SIP3 in the memory (DRAM 4Mbits).
- Address control when recalling the data from the memory

SCSI controller

- NCR 53CF92A which supports the SCAM (SCSI Configured AutoMatically) function
- Conforms to SCSI-2

- SCAM Function -

With this function, the SCSI ID is set automatically by the SCSI adapter in the host computer. This function can be used only when the SCSI adapter in the host computer also has this function, and DIP switch #1 of the machine is turned on. When this function is enabled, the setting of the rotary switch is ignored.

If DIP switch #1 is turned off or the SCSI adapter does not support this function, the SCSI ID of the machine must be set by the rotary switch.

If two units of this machine are connected to a SCSI adapter included in a host computer which supports the SCAM function, the SCSI ID of one or both machines must be set manually (turn off DIP switch #1 and set the rotary switch to the appropriate ID). This is because the machine has the same product ID and the host computer can not distinguish between two machines with the same product ID.

3. INSTALLATION

3.1 ENVIRONMENT

Please observe the following precautions in order to ensure safe operation of the scanner and to realize its full performance.

- Ambient illumination must be less than 2,000 lux (do not expose to direct sunlight).
- Do not use the scanner in any location that is exposed to frequent vibration.
- Do not expose the scanner to dusty or corrosive atmospheric conditions (30 m^3/hr/person).
- Ensure that the area in which the scanner is used is well ventilated.
- Make sure that the surface on which you place the scanner is stable and level.

3.1.1 ENVIRONMENTAL CONDITIONS

Temperature: 10 to 32 °C (50 to 90 °F)

Humidity: 20 to 80 %

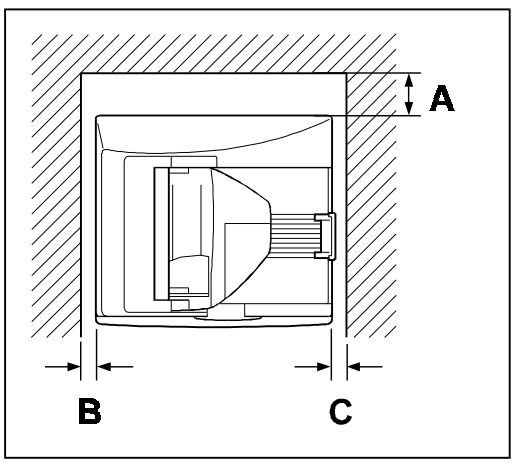
3.1.2 MACHINE LEVEL

1. Front to Back: Within 5 mm (0.2”) of level
2. Right to Left: Within 5 mm (0.2”) of level

3.1.3 MINIMUM SPACE REQUIREMENTS

Place the scanner near a power source, providing clearance as shown.

A: 50 mm (2 ins) B: 100 mm (4 ins) C: 30 mm (1.2 ins) D: 600 mm (23.6 ins)



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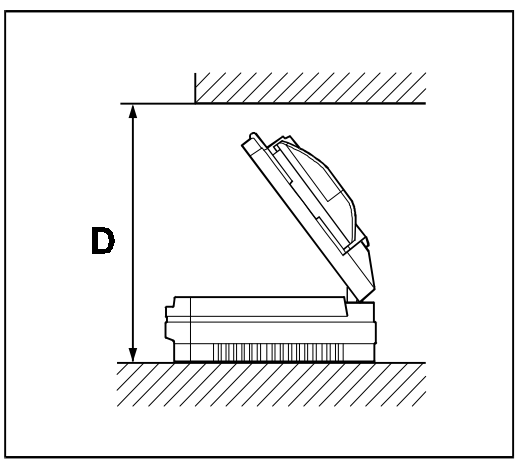


G405I501.CDR

3.1.4 POWER REQUIREMENTS

⚠CAUTION
1. Be sure to ground the scanner.
2. Make sure the plug is firmly inserted in the outlet.
3. Avoid multi-wiring.

1. Input voltage level:
   - 100 to 120 V ac (50/60 Hz)
   - 220 to 240 V ac (50/60 Hz)
2. Permissible voltage fluctuation: ± 10%

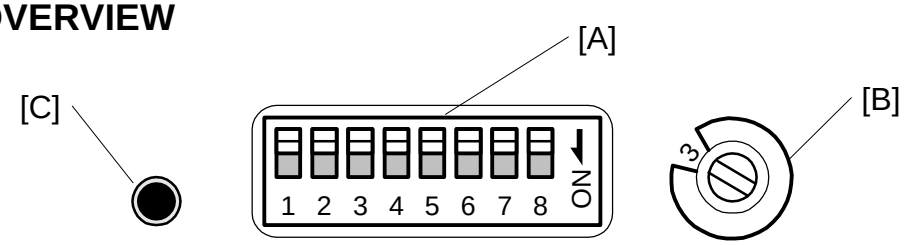
3.2 INSTALLATION PROCEDURES

Please refer to the scanner user's manual for details.

4. SERVICE TABLES

4.1 SERVICE MODE

4.1.1 OVERVIEW



G405M501.VSD

Use the DIP switches [A], the rotary switch [B], and the push switch [C], located at the rear panel of the machine, to perform the various service mode functions.

4.1.2 DIP SWITCH SETTINGS

SW No.	Function	Comments
1	SCAM (SCSI Configured AutoMatically) function **OFF:** Enabled **ON:** Disabled	"SCAM enabled" is the default setting. When SCAM is disabled, the SCSI ID must be programmed using the rotary switch. Disable the SCAM function when: 1. Two or more units of this machine are installed on a SCSI bus. 2. SCAM does not assign a SCSI ID to this machine automatically.
2	Not used	Do not adjust.
3	Paper sizes detected **OFF:** US **ON:** European	Do not change the setting. This switch determines the paper size group detected using the ADF paper size sensors.
4	Not used.	Do not change the setting.
5 to 8	Test mode selection	Refer to the tables on the following pages for full details.

Test Mode Settings

SW5	SW6	SW7	SW8	Function	Comments
OFF	OFF	OFF	OFF	Normal mode	
OFF	OFF	OFF	**ON**	Demonstration mode	Refer to section 4.1.3.
OFF	OFF	**ON**	**ON**	Lamp, solenoid, and clutch test	Refer to section 4.1.4.
OFF	**ON**	OFF	OFF	Sensor test	Refer to section 4.1.5.
OFF	**ON**	OFF	**ON**	Self diagnostics test	Refer to section 4.1.6.
OFF	**ON**	**ON**	OFF	Factory mode	Do not use this setting.
ON	OFF	OFF	OFF	ADF scan counter	Refer to section 4.1.7.
ON	OFF	OFF	**ON**	Flatbed scan counter	Refer to section 4.1.7.
ON	OFF	**ON**	OFF	Lamp on-time counter	Refer to section 4.1.7.
ON	**ON**	**ON**	**ON**	Do not use	.

4.1.3 DEMONSTRATION MODE

DIPSW	Setting	Rotary SW	Function
5	OFF	0	Book mode (200 dpi)
6	OFF	1	Book mode (400 dpi)
7	OFF	2	ADF mode (200 dpi)
8	**ON**	3	ADF mode (400 dpi)
		4 and 5	Not used
		6	ADF free run
		7 to 9	Not used

1. Turn off the machine and adjust the DIPSW and rotary switch settings as shown above.
2. Turn on the machine.
   - Book mode - The machine starts scanning whether an original is present or not.
   - ADF mode - The machine starts scanning when an original is placed into the feeder.
   - ADF free run - The machine starts scanning without an original in the feeder. Feed timings are the same as those in the ADF mode 200 dpi test.
3. Turn off the machine to finish the test, then reset the switches.

NOTE: 1) If the rotary switch is set to the “Not used” position, all the LEDs turn on.
2) If the machine detects a jam while feeding originals, the machine stops the test.

4.1.4 LAMP, SOLENOID AND CLUTCH TEST

DIPSW	Setting	Rotary SW	Function
5	OFF	0	All OFF
6	OFF	1	Scanner lamp ON/OFF
7	**ON**	2	DF pick-up solenoid ON/OFF
8	**ON**	3	DF feed clutch ON/OFF
		4 to 9	Not used

1. Turn off the machine and adjust the DIPSW and rotary switch settings as shown above.
2. Turn on the machine. The selected component is activated.
   Use the push switch to switch the selected component on (activated) and off (deactivated).
3. Turn off the machine to finish the test, then reset the switches.

NOTE: To test an another component, adjust the rotary switch after turning off the machine.

4.1.5 SENSOR TEST

DIPSW	Setting	Rotary SW	Function
5	OFF	0	Scanner home position sensor test
6	**ON**	1	DF registration sensor test
7	OFF	2	DF position sensor test
8	OFF	3	DF original sensor test
		4	DF cover open sensor test
		5 to 9	Not used

1. Turn off the machine and adjust the DIPSW and rotary switch settings as shown above.
2. Turn on the machine.
3. Test the selected sensor. If the sensor is activated, all the LEDs are turned on.
   Example: To test the DF cover open sensor, open and close the DF cover and check if the LEDs turn on and off.
4. Turn off the machine to finish the test. Reset the switches.

NOTE: To test an another component, adjust the rotary switch after turning off the machine.

4.1.6 SELF DIAGNOSTICS

		LED				
DIPSW	**Setting**	**Power (Green)**	**Busy (Amber)**	**Original Set (Green)**	**Error (Red)**	**Error**
5	OFF	Blinking	OFF	OFF	OFF	Memory error
6	**ON**	Blinking	Blinking	ON	ON	Lamp error
7	OFF	Blinking	Blinking	Blinking	ON	Home position error
8	**ON**	Blinking	Blinking	Blinking	Blinking	Shading error

1. Turn off the machine and adjust the DIPSW settings, as shown above.
2. Turn on the machine. If the machine detects an error, the machine displays the error as shown above.
3. Turn off the machine to finish the test. Reset the switches.

NOTE: 1) Refer to section “7. TROUBLESHOOTING” for details of each error.
2) The rotary switch is not used for this test.

4.1.7 COUNTER DISPLAYS

DIPSW	**DF**	**Book**	**Lamp**	**Rotary SW**	**Function**
5	**ON**	**ON**	**ON**	0	Not used
6	OFF	OFF	OFF	1	Unit digit display
7	OFF	OFF	**ON**	2	Tens digit display
8	OFF	**ON**	OFF	3	Hundreds digit display
				4	Thousands digit display
				5	Ten thousands digit display
				6	Hundred thousands digit display
				7	Millions digit display
				8 and 9	Not used

1. Turn off the machine and adjust the DIPSW and rotary switch settings as shown above.

2. Turn on the machine. The machine shows the selected digit (in binary form) using an LED combination as shown below.

Power (Green)	Busy (Amber)	Original Set (Green)	Error (Red)	Number
OFF	OFF	OFF	OFF	0
OFF	OFF	OFF	**ON**	1
OFF	OFF	**ON**	OFF	2
OFF	OFF	**ON**	**ON**	3
OFF	**ON**	OFF	OFF	4
OFF	**ON**	OFF	**ON**	5
OFF	**ON**	**ON**	OFF	6
OFF	**ON**	**ON**	**ON**	7
ON	OFF	OFF	OFF	8
ON	OFF	OFF	**ON**	9

Display another digit by adjusting the rotary switch (without turning off the machine).
The counter units are as follows:

- DF scan counter - sheets
- Book scan counter - sheets
- Lamp on-time counter - hours

3. Turn off the machine to finish the test, then reset the switches.

4.2 SWITCHES/LEDS

4.2.1 SCU

Item	Function
SW1	8-bit DIP switch
SW2	Rotary switch
SW3	Push switch
TP6	COM1 ground
TP7	+5V from the PSU
TP8	+24V from the PSU
TP10	+12V from the PSU
TP11	-12V from the PSU

4.2.2 SIU

Item	Function
TP1	COM1 ground
TP2	+5V from the SCU

4.3 SPECIAL TOOLS

Part Number	Name
A0069104	Scanner Positioning Tool (4 pcs./set)
G4049003	RS-13 Chart (A5)
G4049005	RS-13 Chart (A4)
G4049004	RS-13 Chart (A3, 55 kg)
G4049006	RS-13 Chart (A3, 90 kg)
H2039114	RS-12 Chart (A3)

5. PREVENTIVE MAINTENANCE

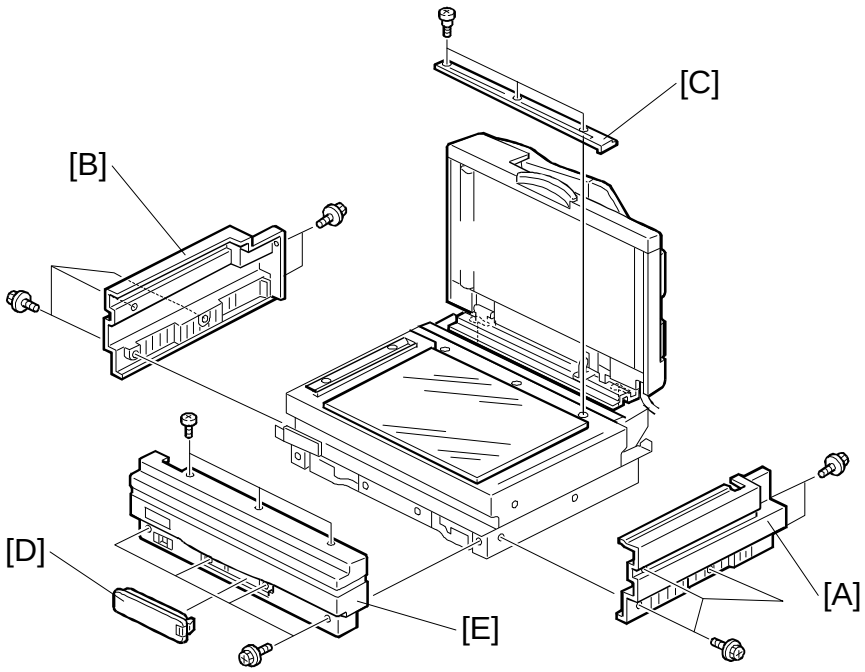
5.1 PM TABLE

SCANNER/OPTICS	EM	100k	200k	300k		Note
Reflector	C					Optics cloth
1st Mirror	C					Optics cloth
2nd Mirror	C					Optics cloth
3rd Mirror	C					Optics cloth
Scanner Guide Rails	C					Do not use alcohol
Exposure Glass	C					Dry cloth or alcohol
DF	**EM**	**60k**	**120k**	**180k**	**240k**	
Separation Roller Assembly	C	R	R	R	R	User replacement. (Maintenance kit) Use alcohol for cleaning.
Separation Roller	C	R	R	R	R	User replacement (Maintenance kit) Use alcohol for cleaning.
White Plate	C					Dry cloth or alcohol
DF Exposure Glass	C					Dry cloth or water
Platen Cover	C					Dry cloth or alcohol

PM for the scanner optics should be done by the user.

6. REPLACEMENT AND ADJUSTMENT

6.1 EXTERIOR

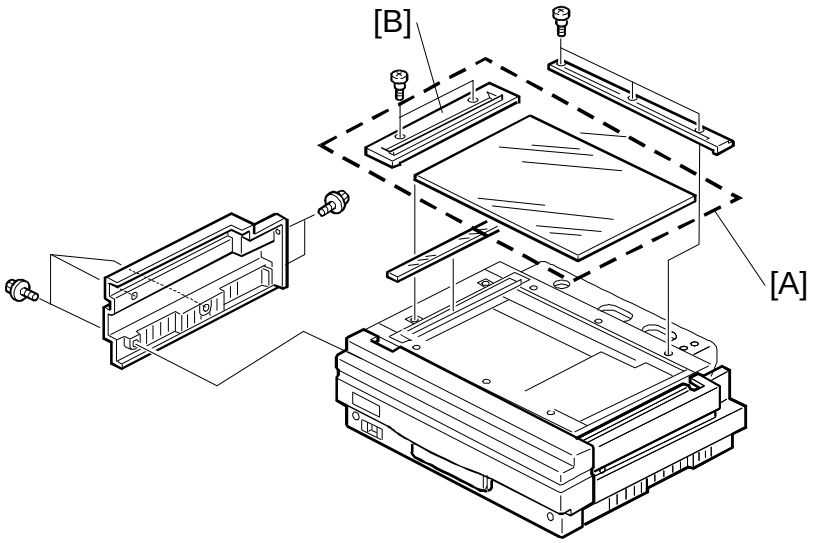


G405R516.CDR

6.1.1 OUTER COVERS

1. Remove the right cover [A] (5 screws).
2. Remove the left cover [B] (5 screws).
3. Remove the rear scale [C] (3 screws).
4. Remove the connector cover [D].
5. Remove the front cover [E] (7 screws).

6.1.2 EXPOSURE GLASS/DF EXPOSURE GLASS/LEFT SCALE



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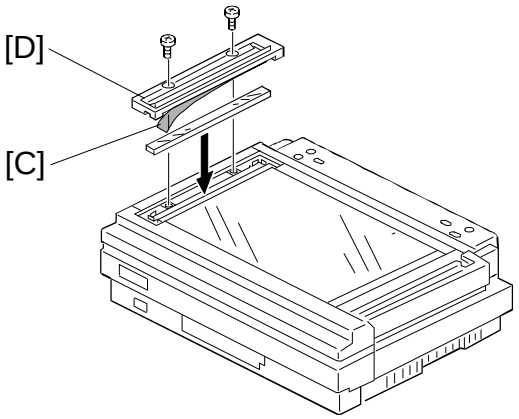
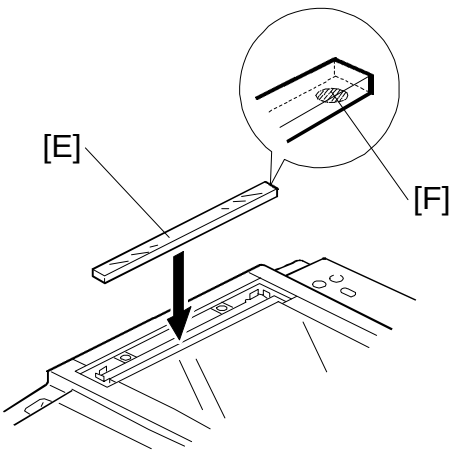


G405R518.CDR



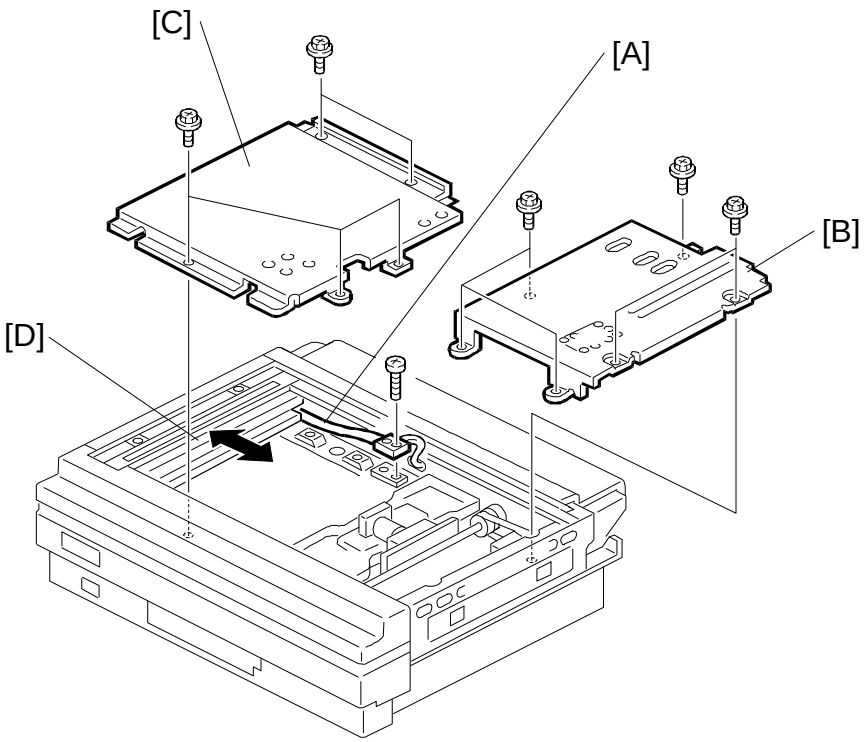
G405R517.VSD

1. Remove the rear scale and left cover (see Outer Covers).
2. Remove the exposure glass with the left scale [A] (2 screws).
3. Remove the left scale [B].
   NOTE: 1) Before installing the new left scale, remove the remaining glue on the exposure glass.
   2) When installing the new left scale, peel off the backing of the double-sided tape [C], attached to the underside of the left scale [D].
4. Remove the DF exposure glass [E].

NOTE: When installing the DF exposure glass, make sure the white dot [F] on the DF exposure glass is positioned as shown.

6.2 SCANNER UNIT

6.2.1 LENS COVERS

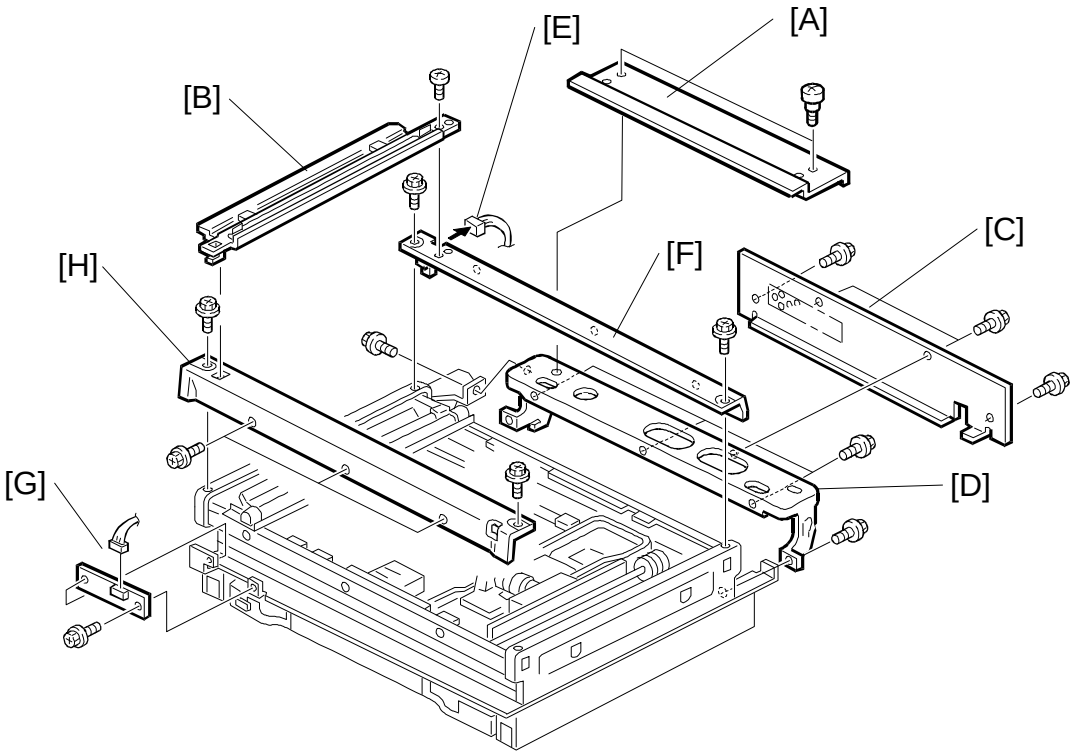


G405R500.cdr

1. Remove the rear scale and right cover (see Outer Covers).
2. Remove the exposure glass with the left scale (see Exposure Glass).
3. Remove the flat cable [A] (1 screw).
4. Remove the right lens cover [B] (6 screws) and left lens cover [C] (5 screws).

NOTE: Move the scanner [D] to access the screw, as shown.

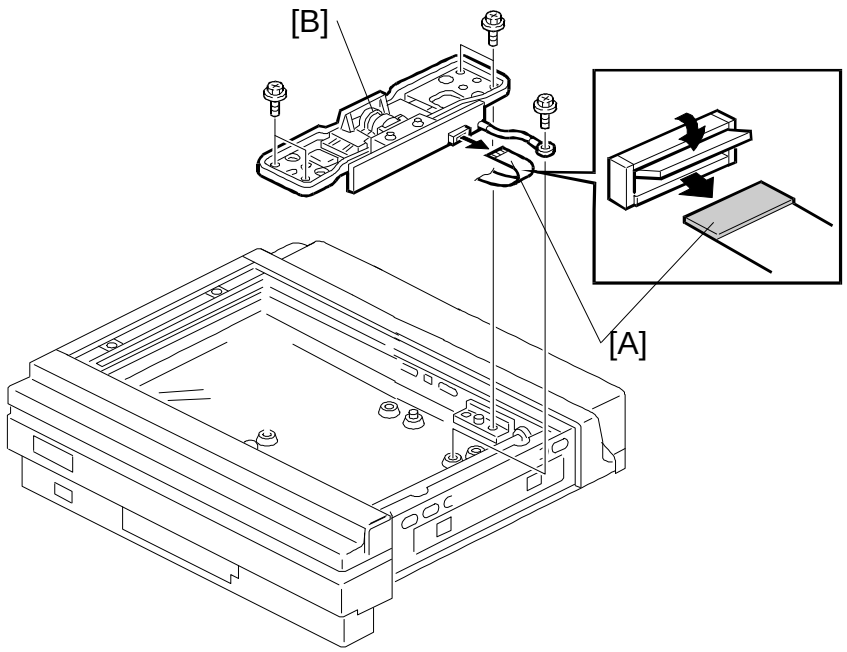
6.2.2 SCANNER FRAMES/UPPER REAR COVER



G405R503.cdr

1. Remove the ADF (see ADF Removal).
2. Remove all outer covers (see Outer Covers).
3. Remove the exposure glass with left scale and DF exposure glass (see Exposure Glass/DF Exposure Glass/Left Scale).
4. Remove the upper rear cover [A] (2 screws).
5. Remove the exposure glass bracket [B] (1 screw).
6. Remove the rear cover [C] (4 screws).
7. Remove the lower rear scanner frame [D] (6 screws).
8. Disconnect the scanner H.P. sensor [E] and remove the frame [F] (1 connector and 2 screws).
9. Remove the indicator panel [G] (1 connector and 1 screw).
10. Remove the front scanner frame [H] (5 screws).

6.2.3 LENS BLOCK

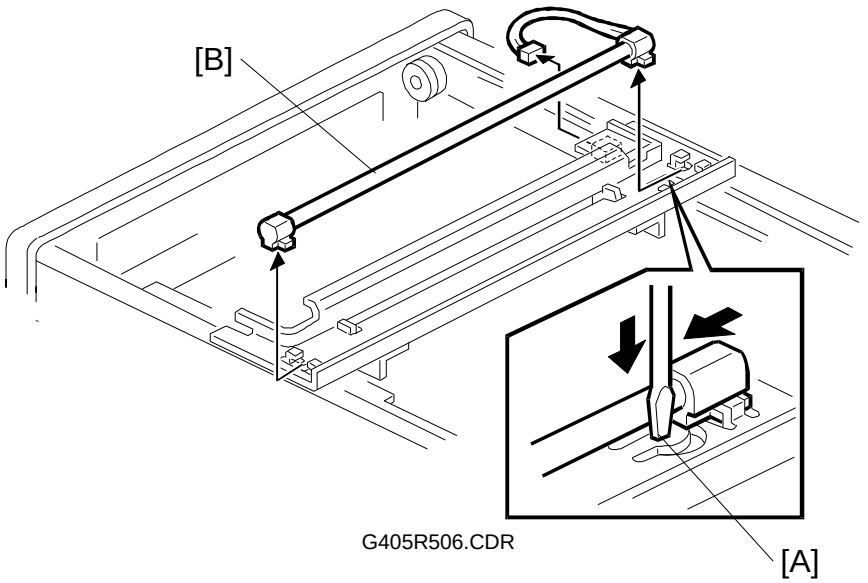


G405R505.CDR

1. Remove the exposure glass and operation panel (see Exposure Glass/DF Exposure Glass/Left Scale).
2. Remove the lens covers (see Lens Covers).
3. Disconnect the flat cable [A].
4. Remove the lens block [B] (1 grounding wire and 4 screws).

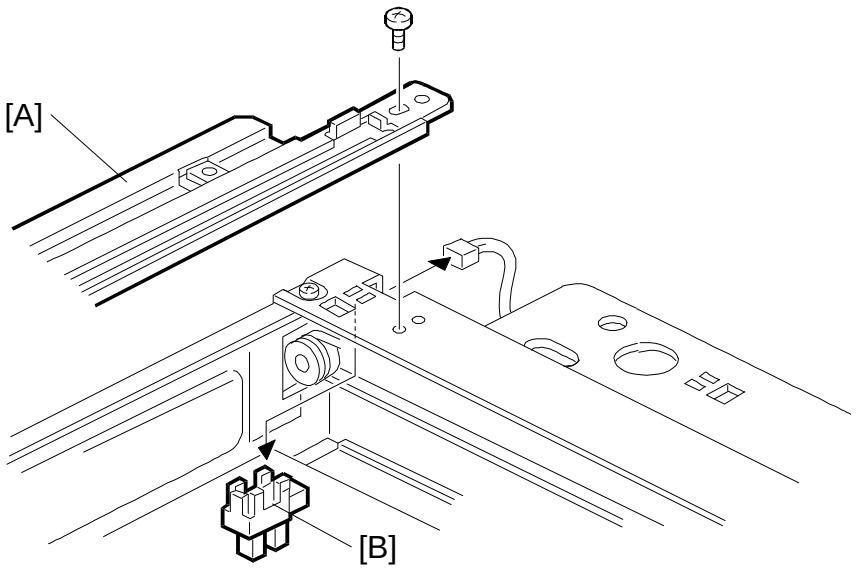
NOTE: Do not touch the surface of the lens.

6.2.4 XENON LAMP



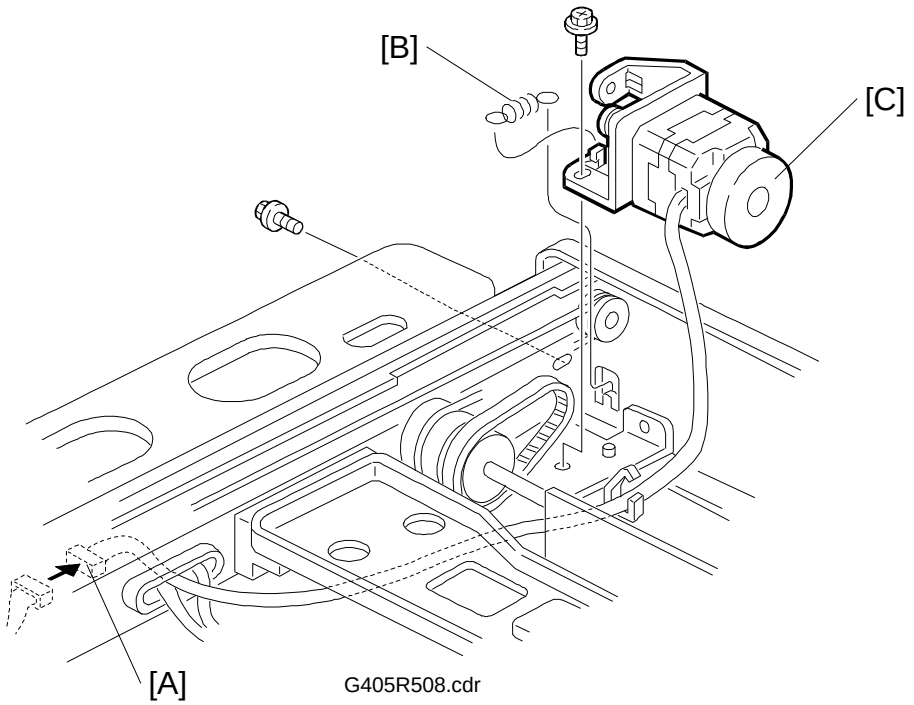
1. Remove the exposure glasses (see Exposure Glass/DF Exposure Glass/Left Scale).
2. Remove the scanner frames (see Scanner Frames).
3. Press the lamp holder [A] down with a screwdriver.
4. Slide the xenon lamp [B] to the front and remove it (1 connector).
   NOTE: Do not touch the glass surface of the xenon lamp.
5. After installing the new lamp, press the lamp holder into the original position to hold the lamp properly.

6.2.5 SCANNER H.P. SENSOR



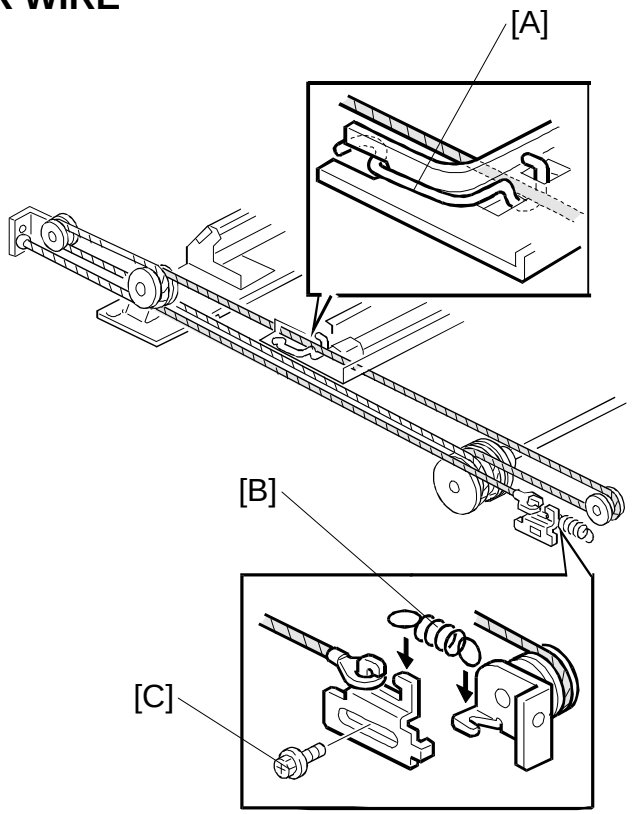
1. Remove the exposure glass and upper rear cover. (See the Outer Covers and Exposure Glass sections.)
2. Remove the scale bracket [A] (1 screw) and replace the scanner H.P. sensor [B] (1 connector).

6.2.6 SCANNER MOTOR



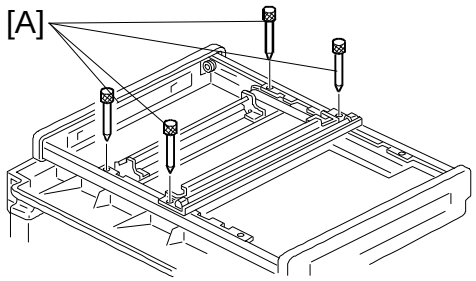
1. Remove the exposure glass (see the Outer Covers and Exposure Glass sections).
2. Remove the lens covers (see Lens Covers).
3. Remove the scanner frames (see Scanner Frames)
4. Disconnect the harness [A].
5. Remove the tension spring [B].
6. Remove the motor/bracket assembly [C] (2 screws).
7. Secure the new motor with the tension spring.

6.2.7 SCANNER WIRE

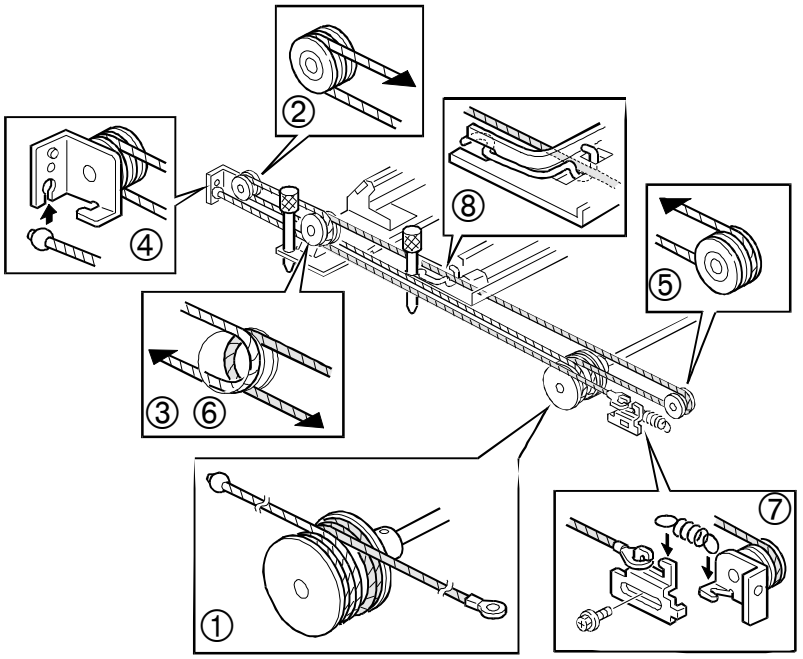


G405R510.CDR

1. Remove the exposure glass (see the Outer Covers and Exposure Glass sections).
2. Remove the lens covers (see Lens Covers).
3. Remove the scanner frames (see Scanner Frames).
4. Remove the hook [A] securing the 1st scanner and remove the 1st scanner.
5. Remove the spring [B].
6. Loosen the screw [C] securing the wire tension bracket. Loosen the other screw on the opposite side.
7. Remove the scanner wire.



G405R509.CDR

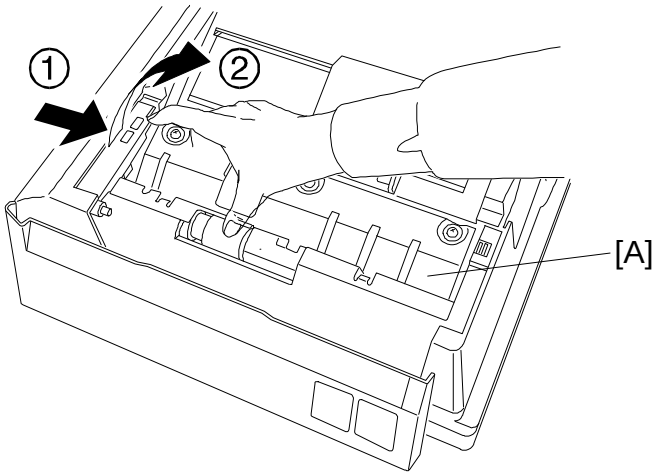


G405R523.CDR

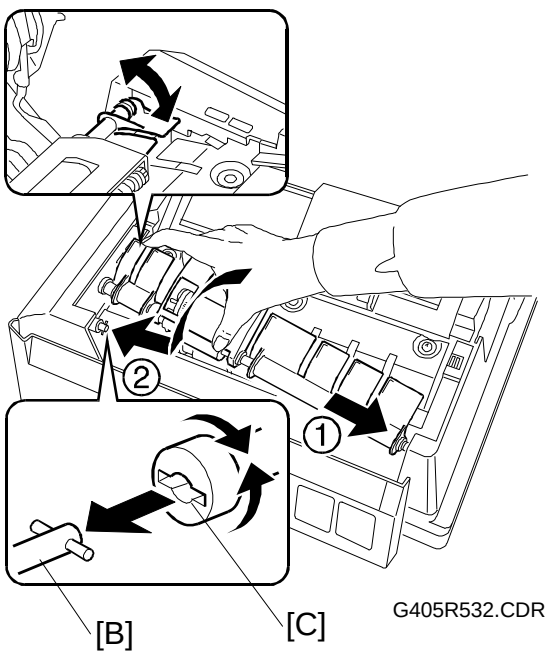
8. Wind the new scanner wire on the pulley in the correct direction as shown in illustration ①.
9. Wind the end of the new wire with the ball as shown in illustrations ② - ④.
10. Wind the end of the new wire with the ring as shown in illustrations ⑤ - ⑦.
11. Secure the wire tension bracket screw, with the wire tension spring pulled as shown in illustration ⑦.
12. Install the 1st scanner and adjust its position with the scanner positioning tools (P/N A0069104) [A]. Then clamp the 1st scanner with the scanner positioning hook as shown in illustration ⑧.
13. Remove the positioning tools. After sliding the scanner to the left and right several times, re-set the scanner positioning tools and re-check the clamp position and wire tension bracket position again.
14. Test the scanner using the book mode free run (See Service Tables - Demonstration Mode).

6.3 ADF

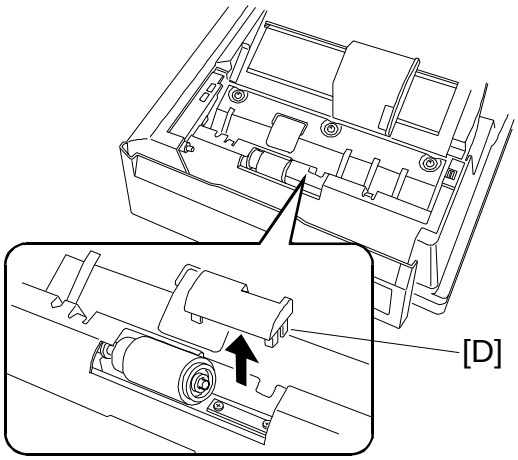
6.3.1 ORIGINAL FEED UNIT/SEPARATION ROLLER



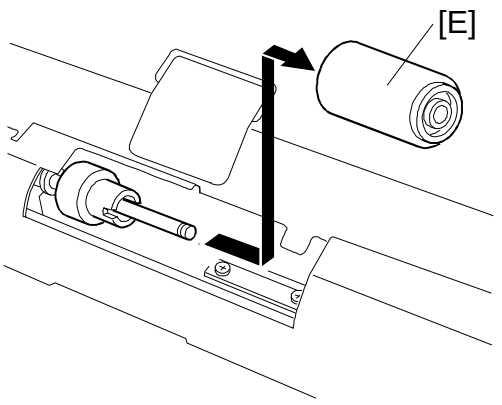
1. Open the DF feed cover.
2. Remove the original feed unit [A], as shown.



NOTE: When reinstalling the original feed unit, make sure that the pin on the end of the shaft [B] fits into the slot in the drive shaft [C] properly as shown.



G405R527.CDR



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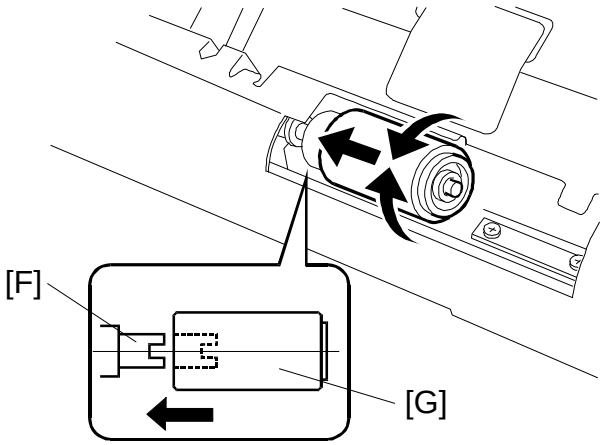
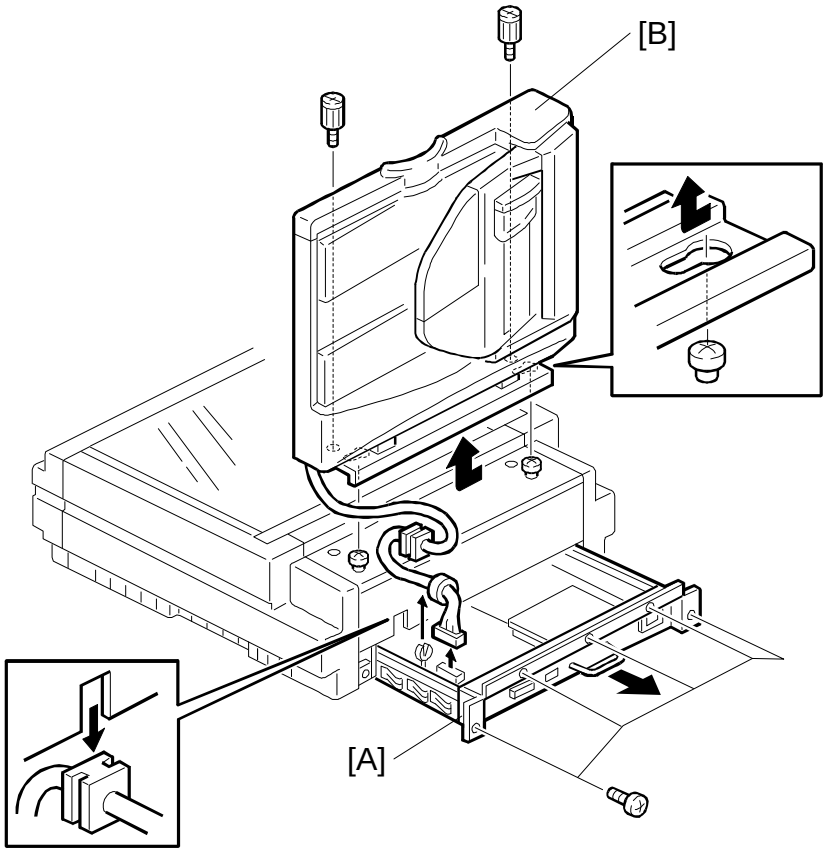


G405R530.CDR

3. Remove the separation roller holder [D].
4. Remove the separation roller [E].
   NOTE: When reinstalling the separation roller, make sure the drive shaft [F] fits into the hole in the separation roller [G] properly as shown.

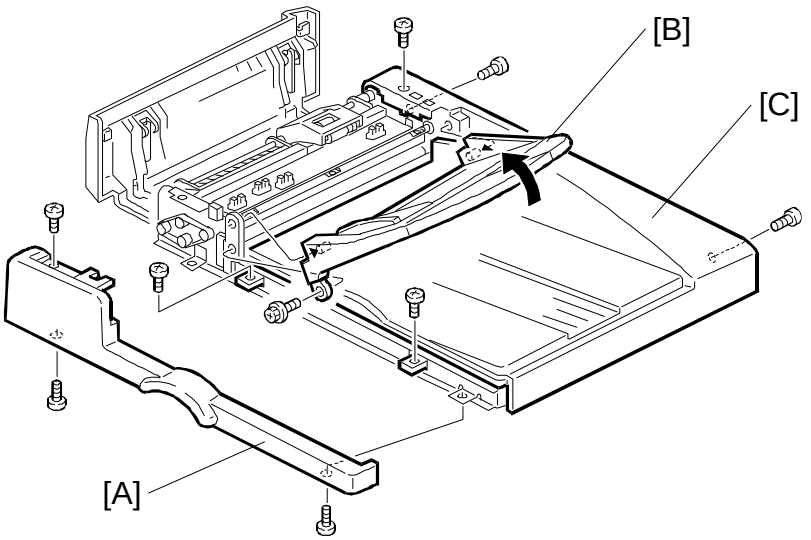
6.3.2 ADF REMOVAL



G405R504.CDR

1. Turn off the machine and disconnect the power cable.
2. Remove the PCB case's 5 screws, then pull out the PCB case [A] until it stops.
3. Remove the ADF [B] (1 connector and 2 screws).

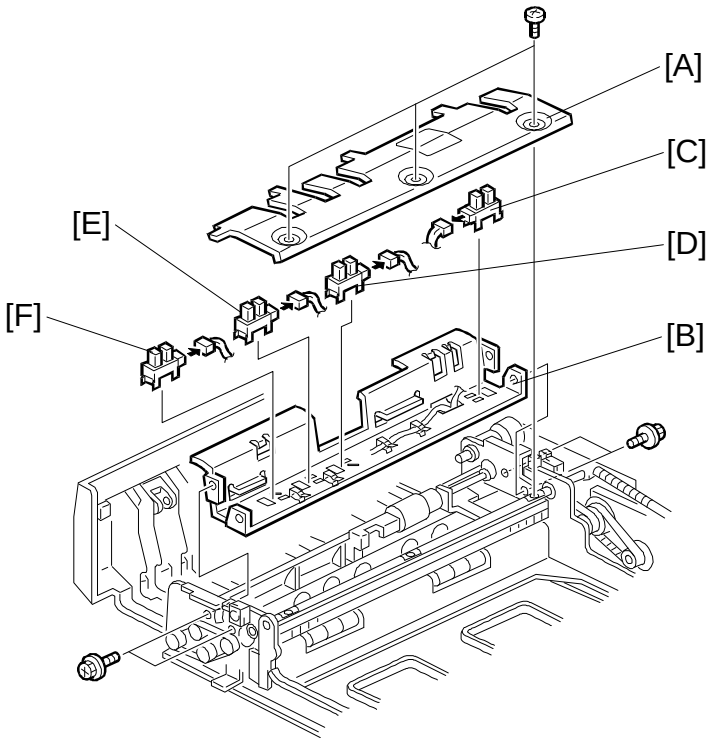
6.3.3 DF COVER REMOVAL



G405R512.CDR

1. Open the DF feed cover.
2. Remove the DF front cover [A] (3 screws).
3. Remove the original table [B] (1 screw).
4. Remove the DF rear cover [C] (5 screws).

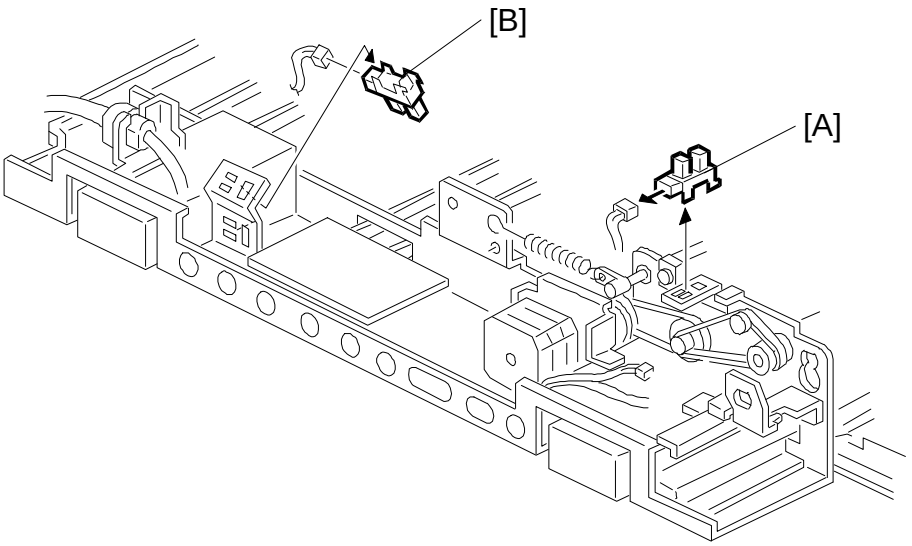
6.3.4 ORIGINAL SET SENSOR AND WIDTH SENSORS



G405R511.CDR

1. Open the DF feed cover.
2. Remove the original feed unit (see Original Feed Unit/Separation Roller).
3. Remove the DF front cover, original table and DF cover (see DF Cover Removal).
4. Remove the entrance guide [A] (3 screws).
5. Remove the sensor bracket [B] with sensors (4 screws).
6. Replace the following sensors.
   Original Set Sensor [C]
   Original Width Sensor 1 [D]
   Original Width Sensor 2 [E]
   Original Width Sensor 3 [F]

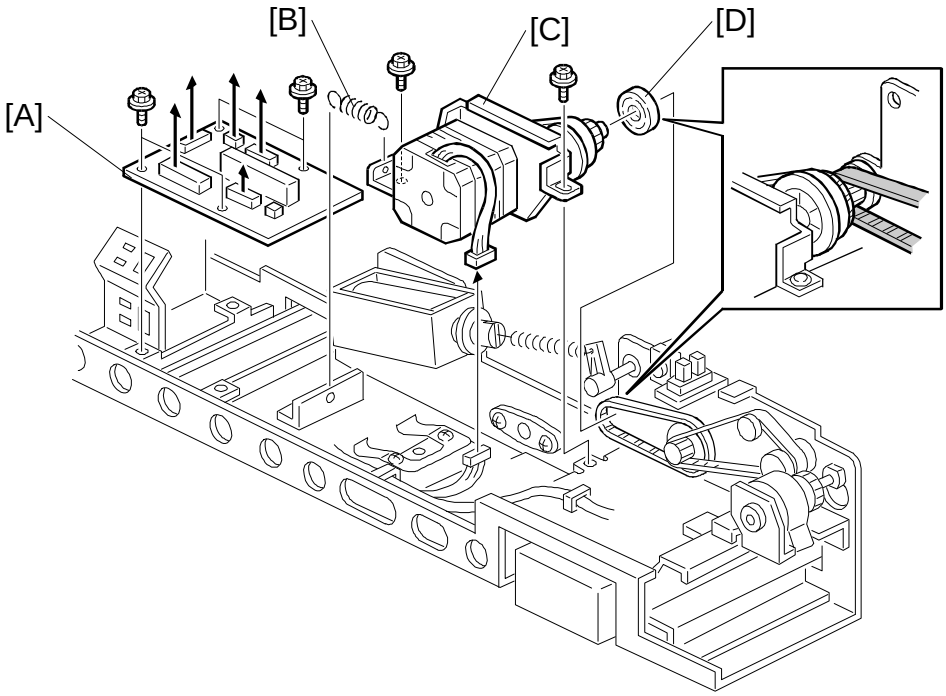
6.3.5 DF FEED COVER OPEN ANS DF POSITION SENSORS



G405R513.CDR

1. Remove the DF rear cover (see DF Cover Removal).
2. Replace the following sensors.
   DF Feed Cover Open Sensor [A] (1 connector).
   DF Position Sensor [B] (1 connector).

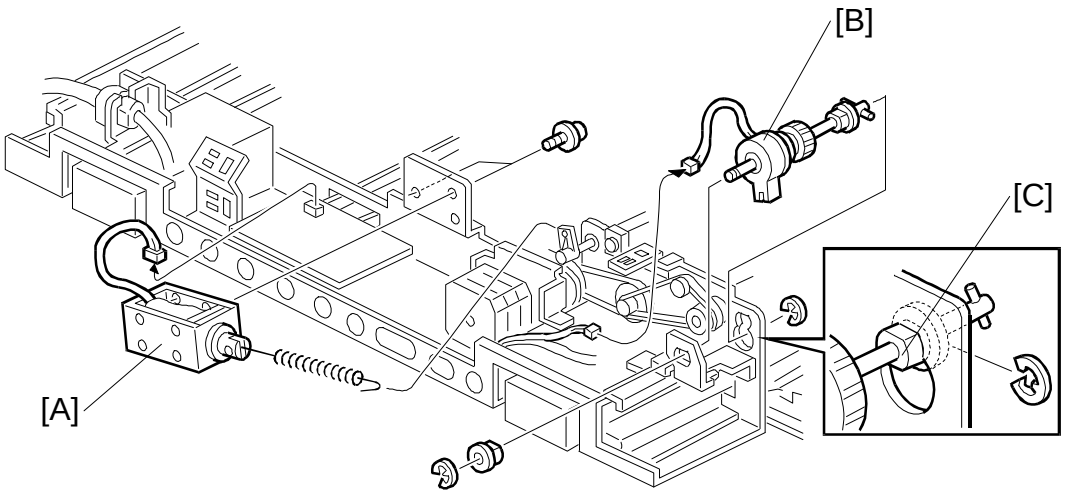
6.3.6 DF FEED MOTOR/DF DRIVE PCB



G405R524.CDR

1. Remove the DF rear cover. (See DF Cover Removal).
2. Remove the DF drive PCB [A] (all connectors and 4 screws).
3. Remove the tension spring [B].
4. Remove the DF feed motor [C] (1 connector and 2 screws).
   NOTE: When reinstalling the DF feed motor, be sure to position the spacer [D] and secure the motor in position with the tension spring.

6.3.7 DF FEED CLUTCH AND DF PICK-UP SOLENOID REPLACEMENT

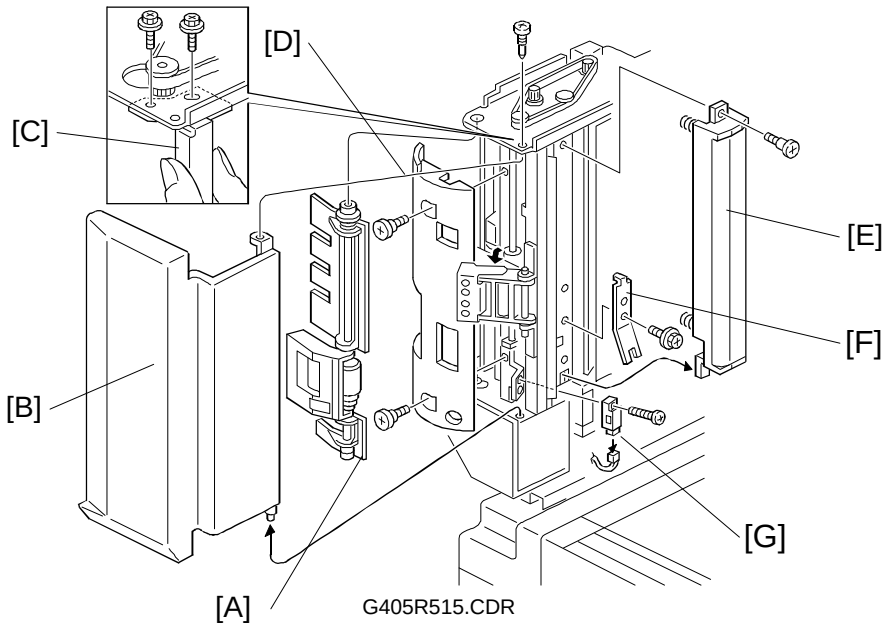


G405R514.CDR

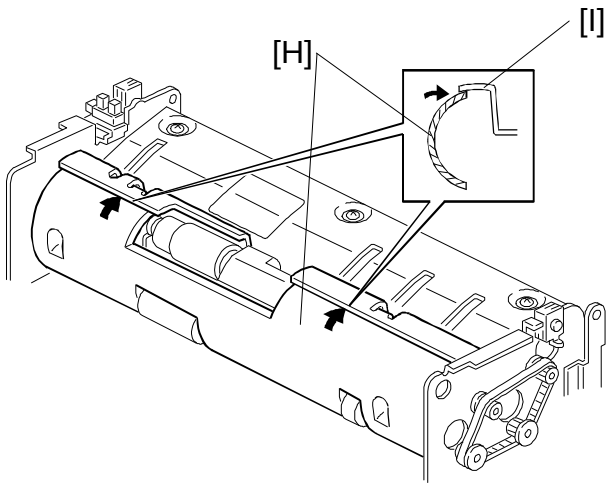
1. Remove the DF rear cover (see DF Cover Removal).
2. Replace the following:
   - DF Pick-up Solenoid [A] (2 screws, 1 connector)
   - DF Feed Clutch [B] (2 E-rings, 1 connector)

   NOTE: When reinstalling the DF feed clutch, be sure to position the bushing [C] as shown.

6.3.8 REGISTRATION SENSOR REPLACEMENT



G405R515.CDR



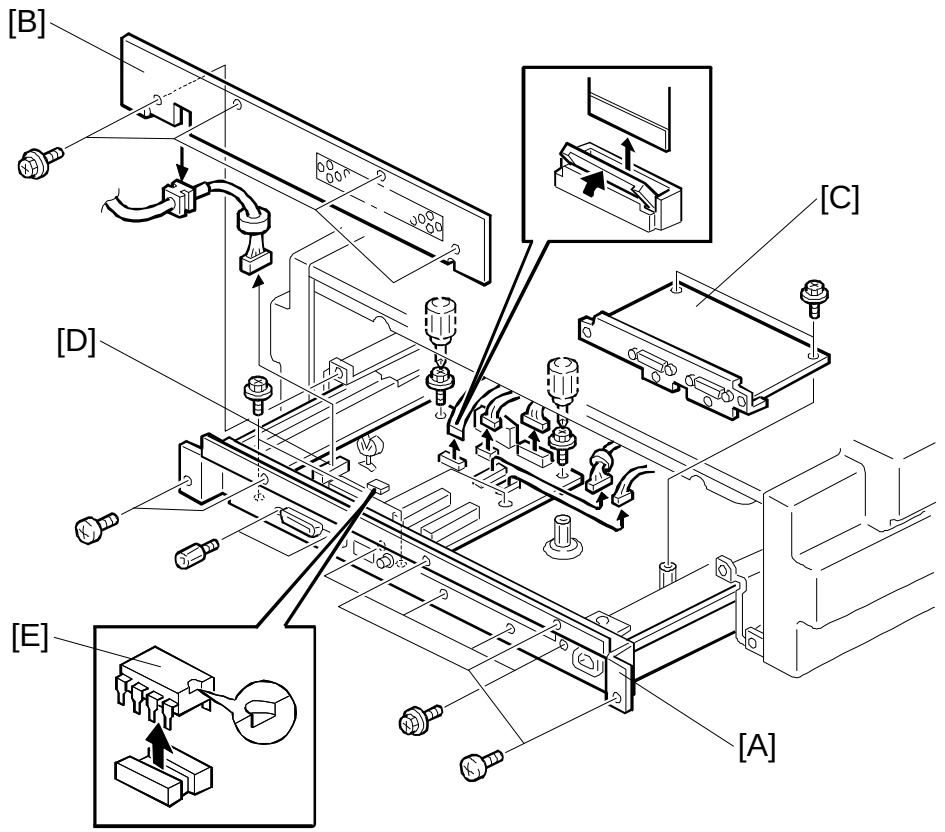
G405R525.CDR

1. Remove the original feed unit [A].
2. Remove the front cover.
3. Remove the DF feed cover [B] (1 screw).
4. Remove the front stay [C] (2 screws).
5. Remove the transport guide [D] (2 screws).
6. Remove the original exposure guide [E] (2 screws).
7. Remove the spring plate [F] (1 screw).
8. Replace the registration sensor [G] (1 screw, 1 connector).

NOTE: When reinstalling the DF feed cover [H], make sure it is in position under the sensor bracket [I] as shown.

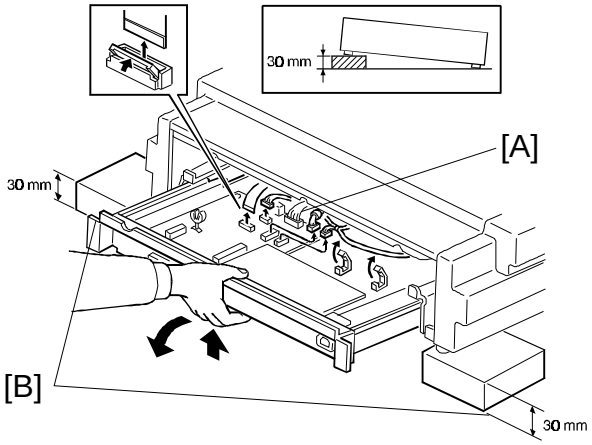
6.4 OTHERS

6.4.1 SIU AND SCU BOARDS

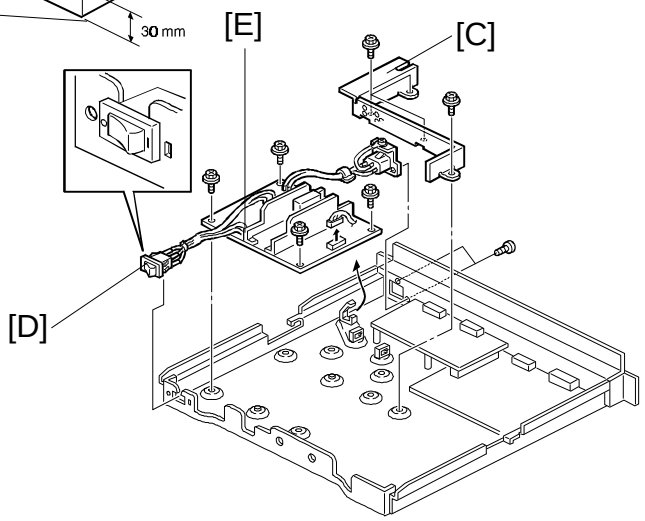


1. Turn off the machine and disconnect the power cable.
2. Disconnect the SCSI cable and terminator.
3. Remove the PCB case's 5 screws, then pull out the PCB case [A] until it stops.
4. Remove the rear cover [B] (5 screws and the DF cable holder).
5. Remove the SIU board assembly [C] (1 connector and 6 screws).
6. Remove the SCU board assembly [D] (all connectors and 7 screws).
7. Put the EEPROM (IC4) [E] from the old SCU on the new SCU.
8. Reassemble the machine.

6.4.2 PSU



G405R519.CDR

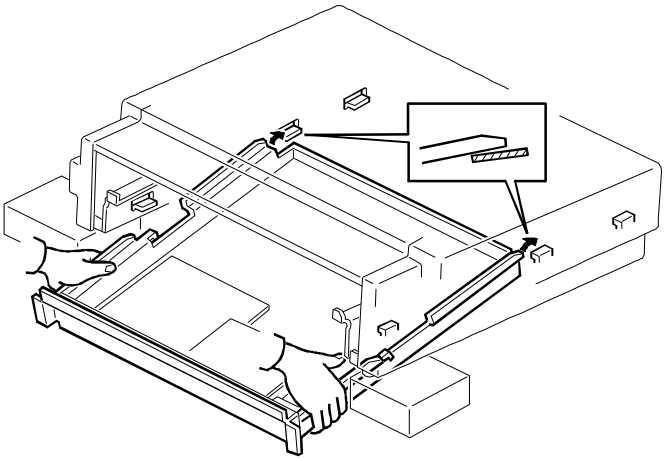


G405R520.CDR

1. Turn off the machine and disconnect the power cable.
2. Pull out the PCB case until it stops (see SIU/SCU Board Removal).
3. Remove the rear cover (see SIU/SCU Board Removal).
4. Disconnect all connectors from the SCU board except for the PSU connector [A] (2 clamps and 5 connectors).
5. Place the rear side of the scanner on a stand [B] (30 mm [1.2 ins] height) to tilt the machine as shown.
6. Lift the drawer a little to release it from the drawer stopper.
7. Slide out the PCB case carefully and put it on the table.
8. Remove the PSU cover [C] (4 screws).
9. Release the main switch [D] from the drawer.
10. Remove the PSU [E] (1 connector and 6 screws).

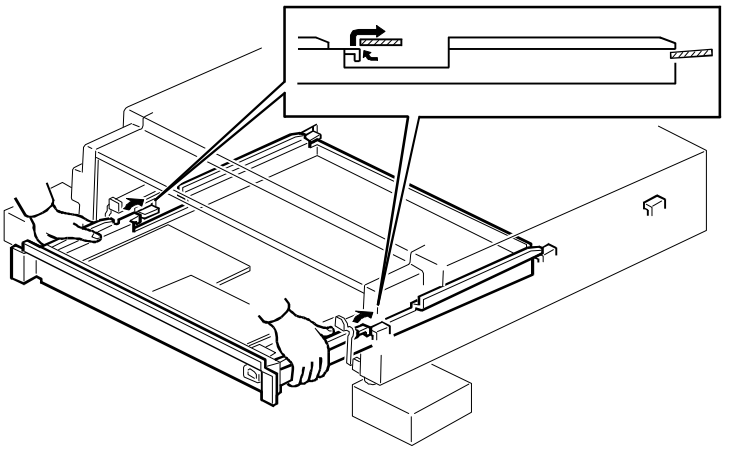
NOTE: When reinstalling the main switch, position it correctly, as shown.

Step 1



G405R522.CDR

Step 2



G405R521.CDR

NOTE: When reinstalling the PCB case, be sure to the position the drawer guide as shown.

7. TROUBLESHOOTING

7.1 ERROR INDICATION

When an error is detected in normal usage mode (DIP switches 5 through 8 are off), the error is indicated by the combination of four LEDs at the front of the scanner. If a system error occurs, details on the type of system error can be checked using the self diagnostic mode (DIP switches 5, 6, 7, 8 : off, on, off, on). The LED indications in each mode are as shown in the tables below.

7.1.1 NORMAL USAGE MODE INDICATION

Conditions	Contents	Document in ADF	LED indication			
			Power on (Green)	Busy (Green)	Document set (Green)	Error (Red)
Initializing	Overall machine check		On	On	On	On
Idle	ADF mode	No	On	--	--	--
		Yes	On	On	On	--
	SADF mode	No	On	--	Blink	--
		Yes	On	--	On	--
Scanning		No	On	On	--	--
		Yes	On	On	On	--
User recoverable error	ADF is lifted up or ADF cover is open		On	--	--	On
	Document jam		On	--	Blinking	On
	Document misfeed		On	--	On	On
System error	See the next page		Blinking	Blinking	Blinking	Blinking

On = LED on, Blinking = LED Blinking, -- = LED off

7.1.2 SELF DIAGNOSTIC MODE INDICATION

Contents	LED indication			
	Power on (Green)	Busy (Green)	Document set (Green)	Error (Red)
Memory error	Blinking	--	--	--
Lamp error *1	Blinking	Blinking	On	On
Home position error	Blinking	Blinking	Blinking	On

On = LED on, Blinking = LED Blinking, -- = LED off

*1: Lamp error is not checked during power on initialization, but it is checked just before scanning or in the self diagnostic mode.

7.2 TROUBLESHOOTING PROCEDURES

There are two types of problem:
- User recoverable error persisting even when the user takes the appropriate action
- System error

Check each possible cause and correct the abnormality.

7.2.1 PERSISTENT USER RECOVERABLE ERROR

1. ADF Lifted Up, ADF Cover Open

Symptom: The error remains even if the ADF and ADF cover are set properly.

Detection Method: The CPU detects that the DF cover open or the DF position sensor is inactive.

Possible Cause:
- The DF cover open sensor is defective.
- The DF position sensor is defective.
- The DF cover open sensor actuator (on the cover) is defective.
- The DF position sensor actuator is defective.
- The DF drive PCB is defective.
- The SCU is defective.
- The harness between each sensor and the DF drive PCB is damaged.
- The harness between the DF drive board and the SCU is damaged.

Do the sensor test to check if the DF cover open and DF position sensor are defective or not. Refer to the Service Tables section for how to do this test.

2. Document Jam

Symptom:
- The jam indication persists even there is no paper in the ADF paper path.
- Frequent jams

Detection Method:
- The CPU detects that the registration sensor is active when the ADF and the ADF cover is set properly.
- The CPU does not detect a change in the registration sensor signal at the proper time.

Possible Cause:
- A torn document remains at the registration sensor position.
- The registration sensor is defective.*1
- The DF drive PCB is defective
- The harness between the registration sensor and the DF drive PCB is damaged
- The harness between the DF drive PCB and the SCU is damaged.
- The SCU is defective
- The document feed motor is defective.
- The harness between the document feed motor and the DF drive PCB is damaged.
- The platen is not set properly.

*1: Do the sensor test to check if the sensor is defective or not (refer to the Service Tables section).
The demonstration mode may be helpful for isolating the problem (refer to the Service Tables section).

3. Document misfeed

Symptom: Frequent misfeeds.

Detection Method: The CPU does not detect a change in the registration sensor signal at the proper time.

Possible Causes:

- The document pick-up roller is worn out.
- The document feed belt unit is not set properly.
- The document feed belt is worn out.
- The registration sensor is defective.
- The DF drive board is defective.
- The SCU is defective.
- The harness between the registration sensor and the DF drive board is damaged.
- The harness between the DF drive board and the SCU is damaged.
- A torn document remains in the paper path between the pick-up roller and the registration sensor.

The demonstration mode may be helpful for isolating the problem (refer to the Service Tables section).

7.2.2 SYSTEM ERROR

1. Memory Error

Symptom: System error is indicated in the normal usage mode and memory error is indicated in the self diagnostic mode.

Detection Method: The CPU performs a sum check on the ROM and a read/write check on the RAM.

Possible Cause: The SCU is defective.

2. Lamp Failure

Symptom: System error is indicated in the normal usage mode and lamp error is indicated in the self diagnostic mode.

Detection Method: The CPU checks if the CCD output is within the specified level during the white plate scan. Note that this check is not made during power on initialization, but just before image scanning or in the self diagnostic mode.
Perform the self diagnostic mode to confirm the symptom (refer to the Service Tables section).

Possible Cause:

- The xenon lamp is defective.
- The lamp inverter is defective.
- The SCU is defective.
- The harness between the inverter and the SCU is damaged.
- The 1st, 2nd, or 3rd mirror is dirty or out of position.
- The SBU is defective.

3. Home Position Error

Symptom: The scanner cannot return the 1st carriage to the home position within the specified period.

Detection Method: The CPU does not detect the signal change within the specified period while moving the carriage back and forth.

Possible Cause:

- The home position sensor is defective.
- The harness between the home position sensor and the SCU is damaged.
- The SCU is defective.
- The carriage drive wire is not fixed to the 1st carriage properly.
- The scanner motor is defective.

7.3 ELECTRICAL COMPONENT DEFECTS

7.3.1 SENSORS

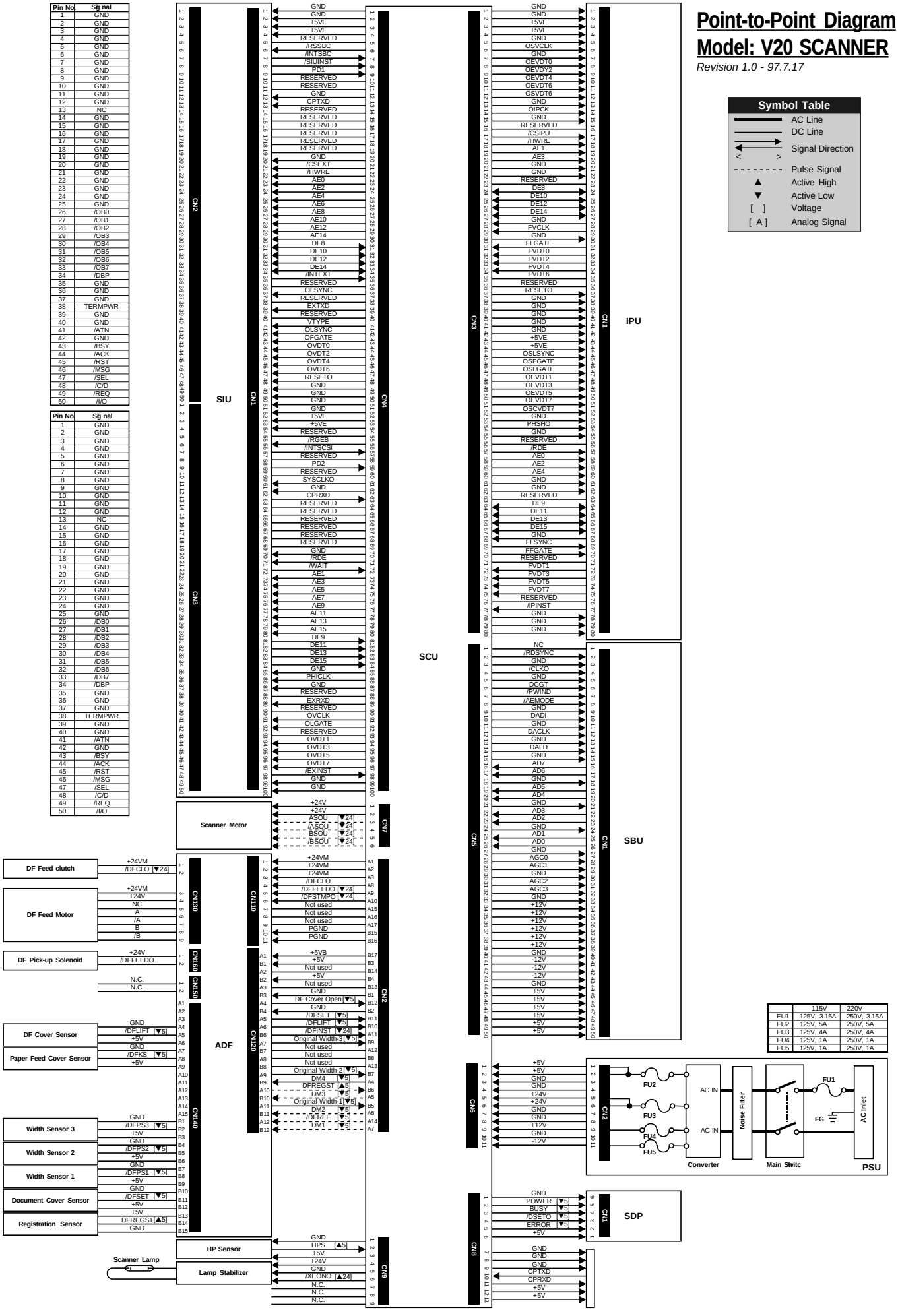
Component (Symbol)	CN	Condition	Symptom
Feed Cover Open (S1)	140-A8 (DF DRIVE)	Open	The error indicator does not light even if the feed cover is opened.
		Shorted	The error indicator lights even if the feed cover is closed.
DF Position (S2)	140-A5 (DF DRIVE)	Open	The error indicator does not light even if the ADF is lifted up.
		Shorted	The error indicator lights even if the ADF is in position.
Original Width 1 (S3)	140-B8 (DF DRIVE)	Open	The CPU cannot detect the original width properly.
		Shorted	
Original Width 2 (S4)	140-B5 (DF DRIVE)	Open	The CPU cannot detect the original width properly.
		Shorted	
Original Width 3 (S5)	140-B2 (DF DRIVE)	Open	The CPU cannot detect the original width properly.
		Shorted	
Original Set (S6)	140-B11 (DF DRIVE)	Open	The CPU does not detect an original when it is placed in the tray.
		Shorted	The CPU detects the original set condition even if there is no original in the tray.
Registration (S7)	140-B14 (DF DRIVE)	Open	The jam indicator lights even if there is no paper.
		Shorted	The jam indicator will light whenever a scan is made in the DF mode.
Scanner H.P (S8)	9-A2 (SCU)	Open	All LEDs will blink when the machine performs power on initialization.
		Shorted	

7.4 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main switch
	100 - 120 V	220 - 240 V	
Power Supply Board			
FU1	3.15 A/125 V	3.15 A/250 V	No response.
FU2	5 A/125 V	5 A/250 V	No response.
FU3	4 A/125 V	4 A/250 V	All LEDs will blink a few minutes after the machine is turned on. The scanner drive motor and the xenon lamp are not driven.
FU4	1 A/125 V	1 A/250 V	All LEDs will blink when the machine performs shading before scanning.
FU5	1 A/125 V	1 A/250 V	All LEDs will blink when the machine performs shading before scanning.
SIU			
F1	1.6 A/250 V	1.6 A/250 V	Power for the terminator is not supplied.

Point-to-Point Diagram
Model: V20 SCANNER

Revision 1.0 - 97.7.17



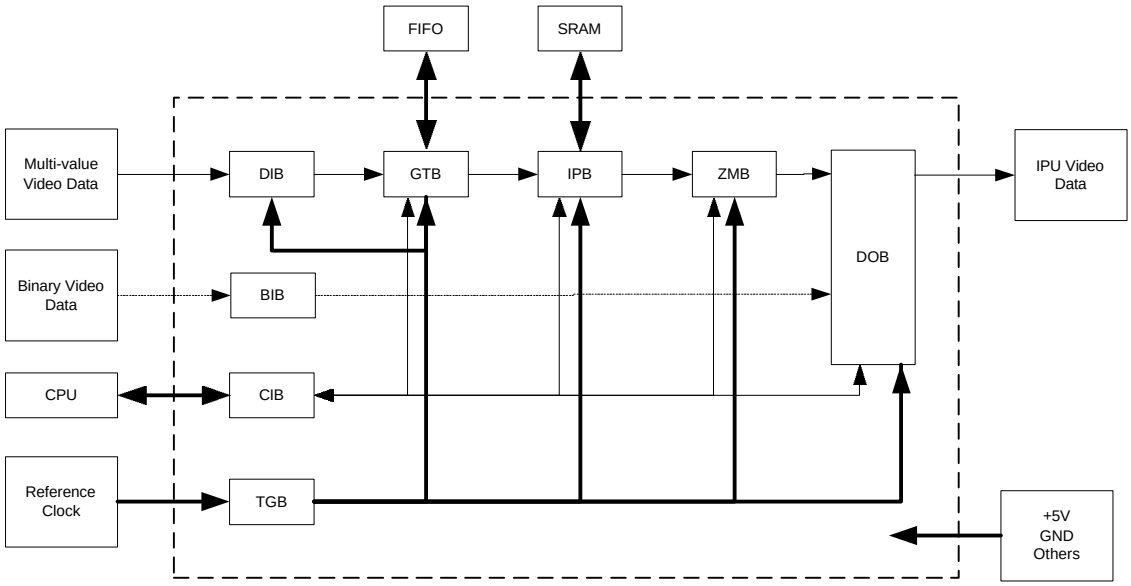
IPU (IMAGE PROCESSING UNIT)

OVERVIEW

The IPU processes Photo/Text separation and Binary conversion automatically.

- **Automatic Photo/Text Separation:** To improve image reproduction of Photo/Text documents, text and photo areas are distinguished automatically and the appropriate image processing is done on them.
- **Automatic Binary Conversion (Dynamic Thresholding):** To improve image reproduction of text which is printed in various densities, the density is detected automatically and the threshold level is adjusted accordingly.

BLOCK DIAGRAM



G405O500.vsd

The IEU consists of the following 8 blocks.

DIB (Video Data Input Block)

The DIB has the following functions: controlling the input of multi-value (8 bit) video data, generating the line reset signal and the page reset signal, and transmitting multi-value video data to the GTB.

BIB (Binary Video Data Input Block)

The BIB has the following functions: controlling the binary video input data, adjusting the delay time for each pixel, and transmitting multi-value video data to the DOB.

GTB (Gamma Translation Block)

The GTB does the following: gamma conversion using an internal 256 byte SRAM, grayscale conversion of multi-value video data (8-bit to 6-bit), and transmission of multi-value video data to the IPB.

IPB (Image Processing Block)

The IPB has the following functions: MTF correction, averaging of input data, edge extraction, gray level separation, determination of photo and text areas, automatic binary processing, erasure of single black dots, unevenness correction, interfacing with the FIFO memory, and transmission of data to the ZMB.

ZMB (Zooming & Mirroring Block)

The ZMB has the following functions: changing magnification, mirroring images, interfacing with SRAM, and data transmission to the DOB.

DOB (Video Data Output Block)

The DOB has the following functions: generating text/photo separation data, black/white image inversion, serial/parallel conversion, MSB/LSB reversal, and video data transmission.

CIB (CPU Interfacing Block)

The CIB interfaces with the CPU and controls register use by other blocks.

TGB (Timing Generator Block)

The TGB generates all timing signals for all blocks.

V20 SCANNER (G405)

PARTS CATALOG

First Edition July 1997

V20 SCANNER (G405)

PARTS CATALOG

INTRODUCTION

This chapter instructs you the numbers and names of parts on this machine.

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2.Optics Section 1 (G405) 4
3.Optics Section 2 (G405) 6
4.Scanner Electrcal Section (G405) 8
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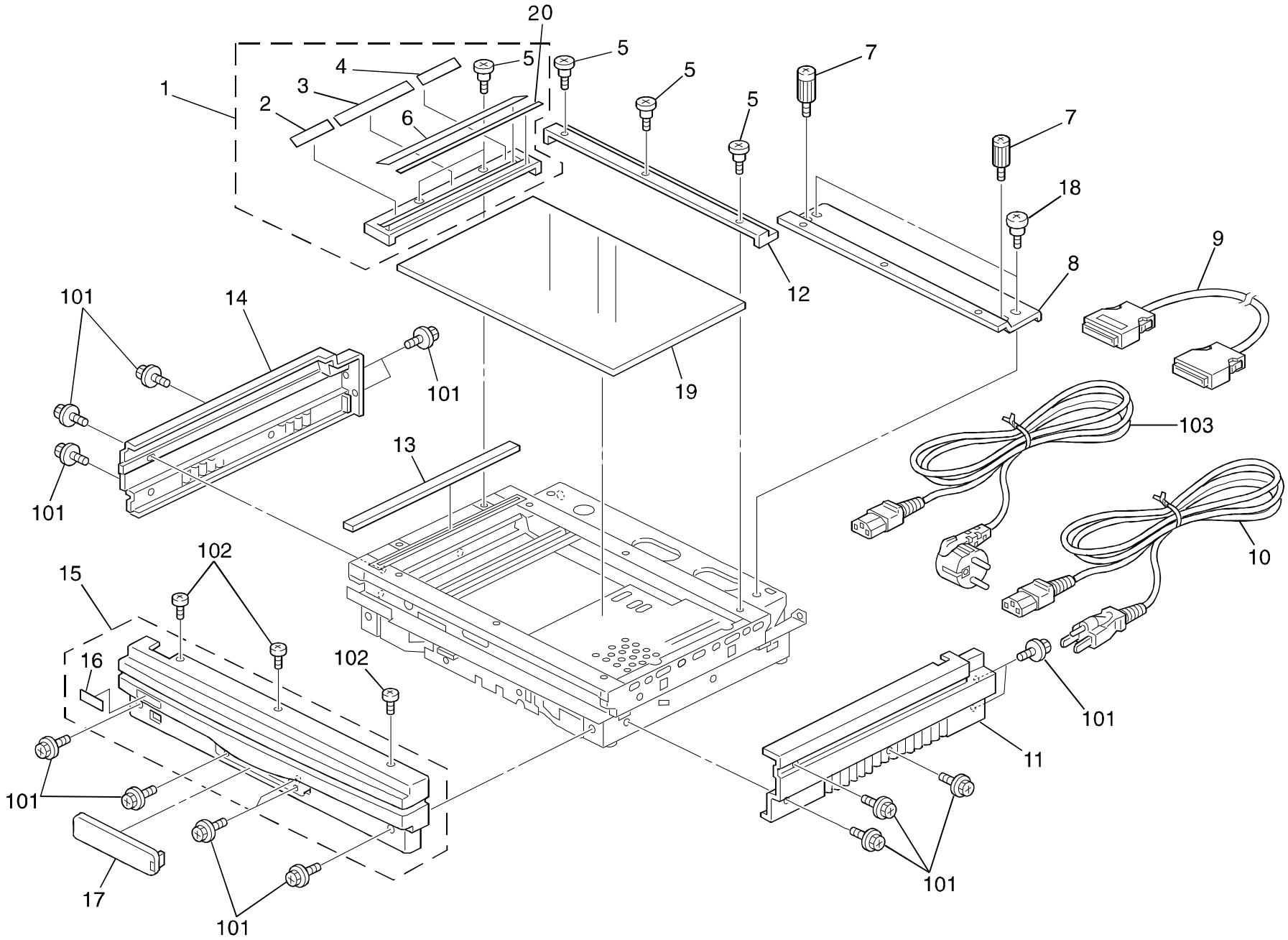
Parts Index 27

July, 30’97

1.Scanner Exterior (G405)

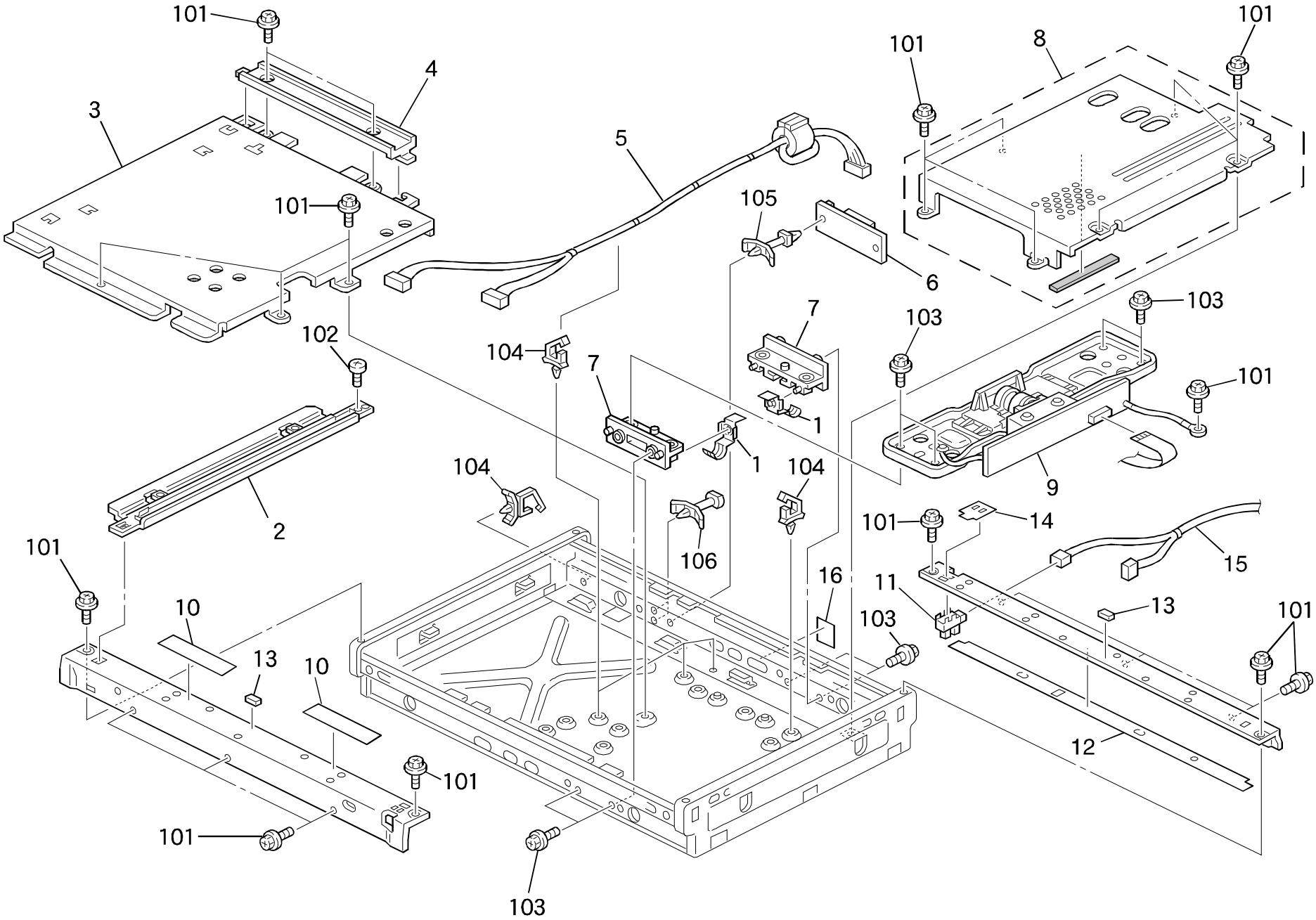


1.Scanner Exterior (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	G405 3291	Vertical Scale Ass'y - Sheet Thru.	1
2	A628 3127	Front Guide Mylar	1
3	A628 3128	Middle Guide Mylar	1
4	A628 3129	Rear Guide Mylar	1
5	A193 1759	Stepped Screw	5
6	A628 3126	Guide - Scale	1
7	A628 3115	Knob Screw - M4	2
8	G405 1511	Cover - Rear	1
9	G404 5570	SCSI Imterface Cab;e	1
10	5490 5212	Power Cord - Ul/CSA 2m	1
11	G405 1531	Cover - Right	1
12	A193 1757	Rear Original Scale	1
13	AC01 3004	Exposure Glass	1
14	G405 1521	Cover - Left	1
15	G405 1540	Cover - Front	1
16	G405 1542	Decal - LED Panel	1
17	A193 1356	Cap - IC Card	1
18	A628 3111	Shoulder Screw - M5	2
19	5215 1980	Exposure Glass - A3t-3.2	1
20	A628 6061	Decal - Original Scal	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0353 0050F	Tapping Screw - M3x5	
102	0353 0050F	Tapping Screw - M3x5	
103	1150 0352	Power Supply Cord (230V)	

2.Optics Section 1 (G405)

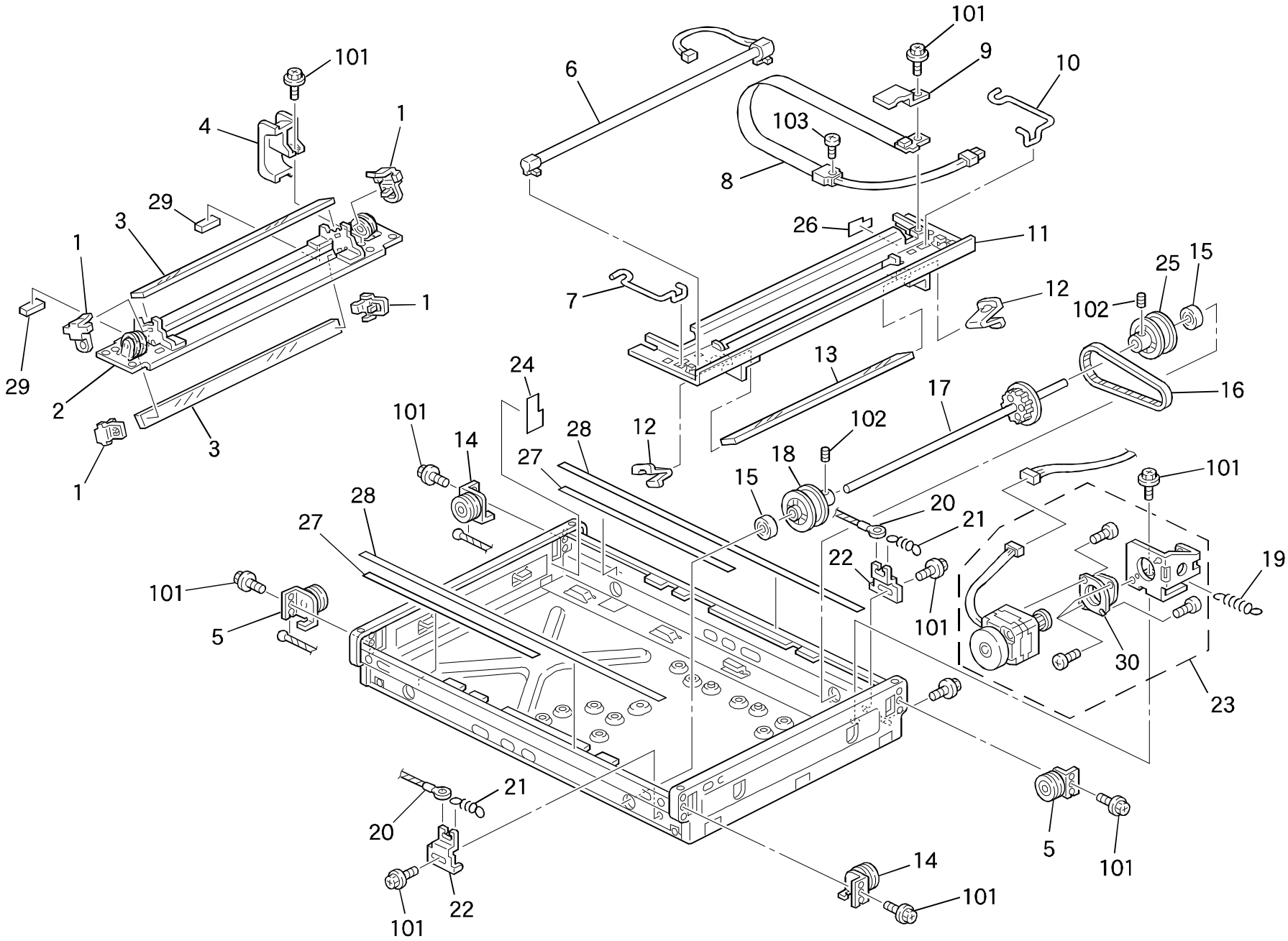


2.Optics Section 1 (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1790	Grounding Plate - Lens Block	1
2	A193 1754	Bracket - Left Origial Scale	1
3	A193 1824	Left Inner Cover - Scanner Unit	1
4	A193 1781	Lower Harness Guide	1
5	G405 5310	Harness - LED Panel	3
6	A193 5730	Stabilizer - Xenon Lamp	1
7	A193 1826	Lens Block Holder	2
8	A193 1689	Right Inner Cover	1
9	A193 1673	Lens Holder Ass'y	1
10	A193 1819	Front Seal - Scanner Frame	1
11	AW02 0075	Photointerrupter	1
12	A193 1795	Seal - Scanner Frame	1
13	5442 1924	Exposure Glass Cushion	1
14	A193 1793	Scanner Home Sensor Stopper	1
15	G405 5305	Harness - Scanner Unit	1
16	G405 2735	Cable Holder	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0353 0050F	Tapping Screw - M3x5	
103	0450 3010B	Tapping Screw - M3x10	
104	1105 0460	Clamp	
105	1105 0195	PCB Stud	
106	1105 0415	Spacer - 12.7mm	

3.Optics Section 2 (G405)

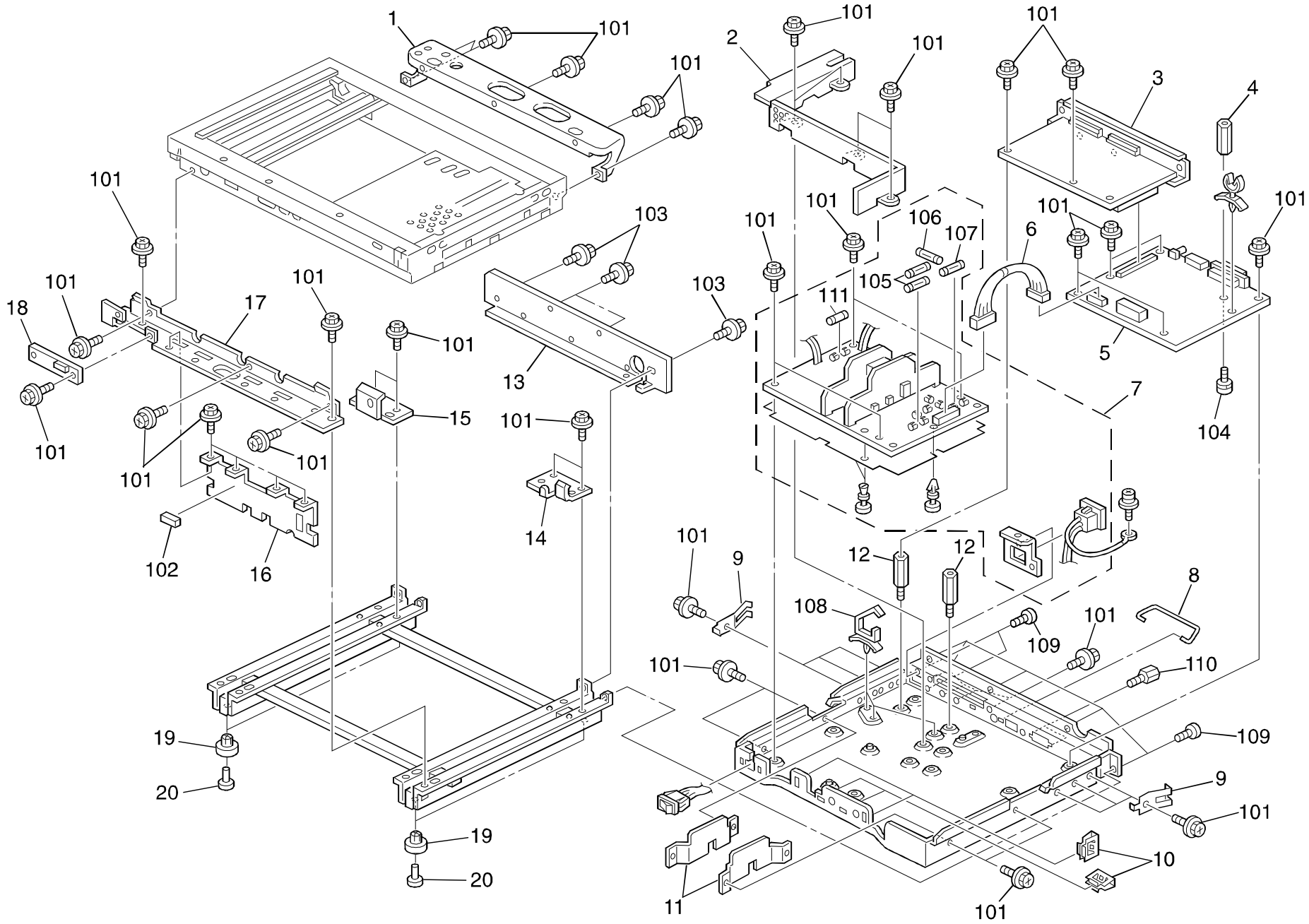


3.Optics Section 2 (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1777	2nd/3rd Mirror Holder	4
2	A193 1770	2nd Scanner Ass'y	1
3	A193 1669	2nd/3rd Mirror	2
4	A193 1776	Upper Harness Guide	1
5	A193 1841	Pulley - Front Left	2
6	A193 5702	Exposure Lamp	1
7	A193 1766	Wire Clamp	1
8	A193 5703	Exposure Lamp Harness	1
9	A193 1799	Harness Guide - Exposure Lamp	1
10	A193 1769	Clamp - Rear Wire	1
11	A193 1760	1st Scanner Ass'y	1
12	A193 1767	1st Mirror Holder	2
13	A193 1764	1st Mirror	1
14	A193 1845	Pulley - Rear Left	2
15	A193 1829	Ball Bearing - M8	2
16	A193 1840	Timing Belt - L220 B8	1
17	A193 1682	Scanner Drive Pulley Ass'y	1
18	A193 1832	Front Scanner Pulley	2
19	A193 1784	Tension Spring	1
20	A193 1838	Scanner Drive Wire	2
21	A193 1783	Tension Spring	2
22	A193 1849	Tension Bracket	2
23	A193 1690	Scanner Motor - DC	1
24	A193 1798	Seal - Side Plate	1
25	A193 1831	Rear Scanner Pulley	1
26	A193 1796	Seal - Carriage	1
27	A193 1817	Slide Rail 2	2
28	A193 1816	Slide Rail	2
29	G405 2752	Stopper - 3rd Mirror	2
30	A193 1844	Stepping Motor Cushion	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	0575 0050E	Hexagon Headless Set Screw - M5x5	
103	0453 3014B	Taping Screw - M3x14	
104	0451 3008B	Tapping Screw - M3x8	

4.Scanner Electrcal Section (G405)

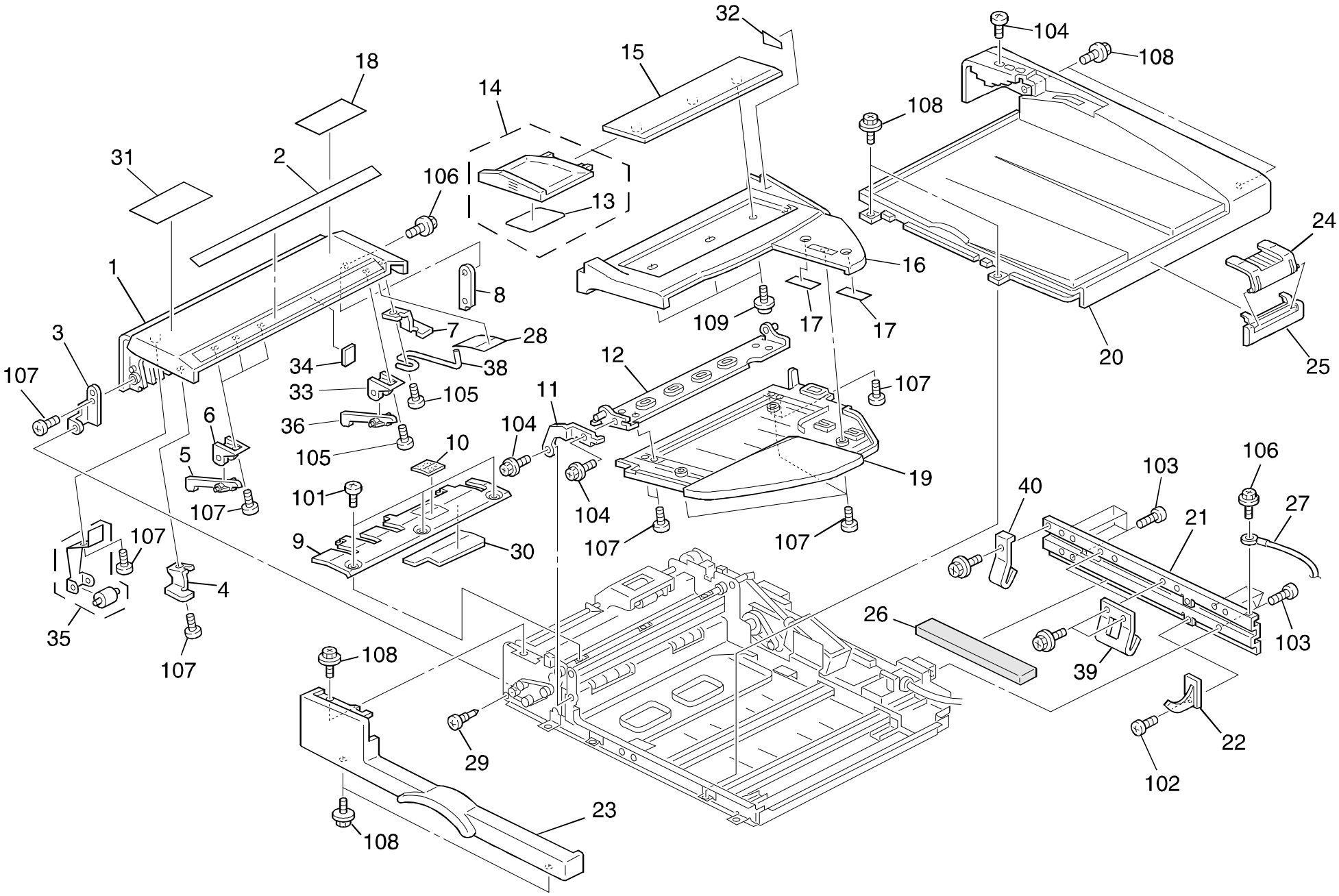


4.Scanner Electrcal Section (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A193 1786	Platen Cover Bracket	1
2	G405 1214	Cover - PSU	1
3	G405 5801	PCB SIU	1
4	G404 5701	Spacer - 18mm	1
5	G405 5652	PCB - SCU	1
6	G405 5320	Harness - PSU	1
7	G405 5100	PSU - 100/120V NA	1
7	G405 5110	Power Supply Unit - 220-240V	1
8	G404 1247	Handle - I/f Board	1
9	G405 1213	Grounding Plate	6
10	G020 2731	Grounding Plate	4
11	G405 1216	PSU Guide	2
12	G405 1212	Stud - I/F Board	2
13	G405 1221	Cover - PCBS	1
14	G405 1152	Bracket - Right - Rear	1
15	G405 1151	Bracket - Left - Rear	1
16	G405 1160	Bracket - OP Panel	1
17	G405 1150	Bracket - Front	1
18	G405 5400	PCB SDP	1
19	G405 1141	Rubber Foot	4
20	G405 1142	Pin - Rubber Foot	4

Index No.	Part No.	Description	Q'ty Per Assembly
101	0451 3006B	Tapping Screw - M3x6	
102	1102 6250	Connector - 7p	
103	0802 5255	Tapping Screw - M3x8	
104	0950 3008Z	Screw With Spring Washer - M3X8	
105	1107 0871	Fuse - 1A 125V	
105	1107 0881	Fuse - 1A 250V	
106	1107 0873	Fuse - 4A 125V	
106	1107 0870	Fuse - 4A 250V	
107	1107 0868	Fuse - 5A 125V	
107	1107 0884	Fuse - 5A 250V	
108	1105 0310	Wire Clamp	
109	0354 0080Z	Screw - M4X8	
110	1103 3048	Screw - D-SUB Connector	
111	1107 0872	Fuse - 3.15A 125V	
111	1107 0877	Fuse - 3.15A 250V	

5.DF Exterior (G405)

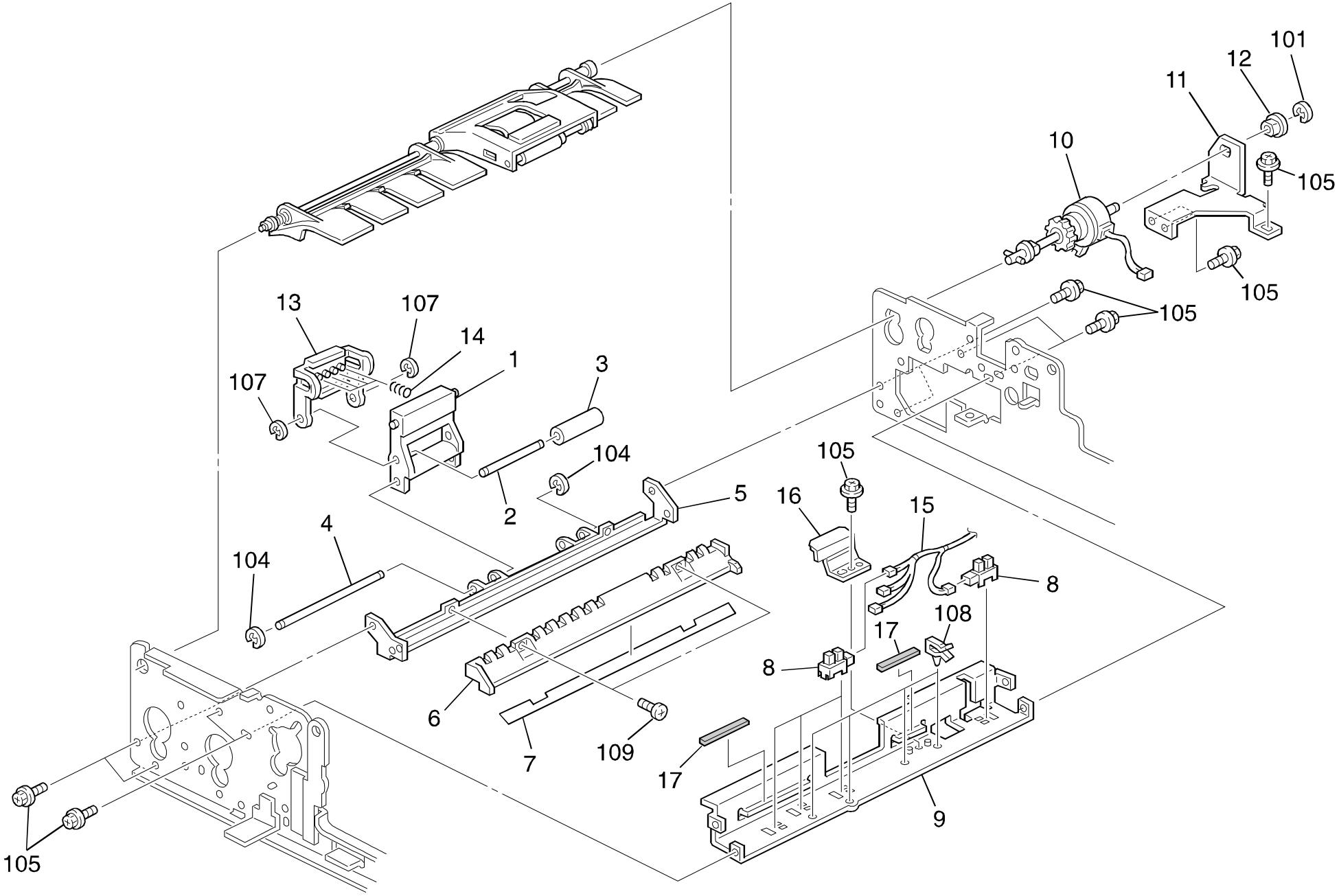


5.DF Exterior (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A628 2131	Left Cover	1
2	A628 6021	Original Size Decal	1
3	A628 2174	Front Cover Hinge	1
4	A628 2176	Front Magnet Catch	1
5	A628 2177	Feeler - Paper Size Detection	4
6	A628 2178	Feeler Bracket - Paper Size Detecti	4
7	A628 2175	Rear Magnet Catch	1
8	A628 2171	Fixing Bracket - Left Cover	1
9	A628 1261	Original Entrance Guide	1
10	A628 1262	Pad - Original Entrance Guide	1
11	A628 2167	Fixing Bracket - Original Table	1
12	A628 2163	Original Table Bracket	1
13	A376 4599	Side Fence Pad	1
14	A628 2185	Side Fence	1
15	A628 2151	Side Fence Guide	1
16	A628 2441	Paper Tray	1
17	A628 2145	Seal - Original Table	2
18	A628 6125	Decal - Exposure Glass Cleaning	1
19	A628 2161	Original Table Cover	1
20	A628 2121	Upper Cover	1
21	A628 1173	Hinge Bracket	1
22	A565 1172	Sensor Actuator	2
23	A628 2111	Front Cover	1
24	A628 2126	Original Stopper	1
25	A628 2127	Original Stopper Holder	1
26	A628 1178	DF Baracket Cushion	1
27	A628 5745	Grounding Wire	1
28	A628 2211	Rear Guide Plate	1
29	5446 2824	Screw - Duplex Guide Plate	1
30	A628 1251	Anti-vibration Weight	1
31	A628 6031	Jam Removal Decal	1
32	A628 6041	Decal - Original Tray	1
33	A661 2172	Bracket - Feeler - Original	1
34	A628 2179	Registration Sensor Shield	1
35	A628 2186	Driven Roller - Pull Out	1

Index No.	Part No.	Description	Q'ty Per Assembly
36	A661 2173	Feeler - Original Feed	1
37	A628 6061	Decal - Original Scal	1
38	A628 2170	Clock Lever - Left Cover	1
39	A628 1174	Right Ground Palte - Hinge Bracket	2
40	A628 1177	Left Ground Plate - Hinge Bracket	1
101	0353 0060F	Philips Truss Head Screw - M3x6	
102	0314 0060B	Philips Pan Head Screw - M4x6	
103	0434 0122B	Tapping Screw - M4x12	
104	0453 3006Z	Tapping Screw - M3x6	
105	0450 4010B	Tapping Screw - 4x10	
106	0451 3006b	Tapping Screw - M3x6	
107	0452 3008B	Tapping Screw - M3x8	
108	0802 5255	Tapping Screw - M3x8	
109	0951 4008B	Philips Screw With Washer - M4x8	

6.Original Feed section (G405)

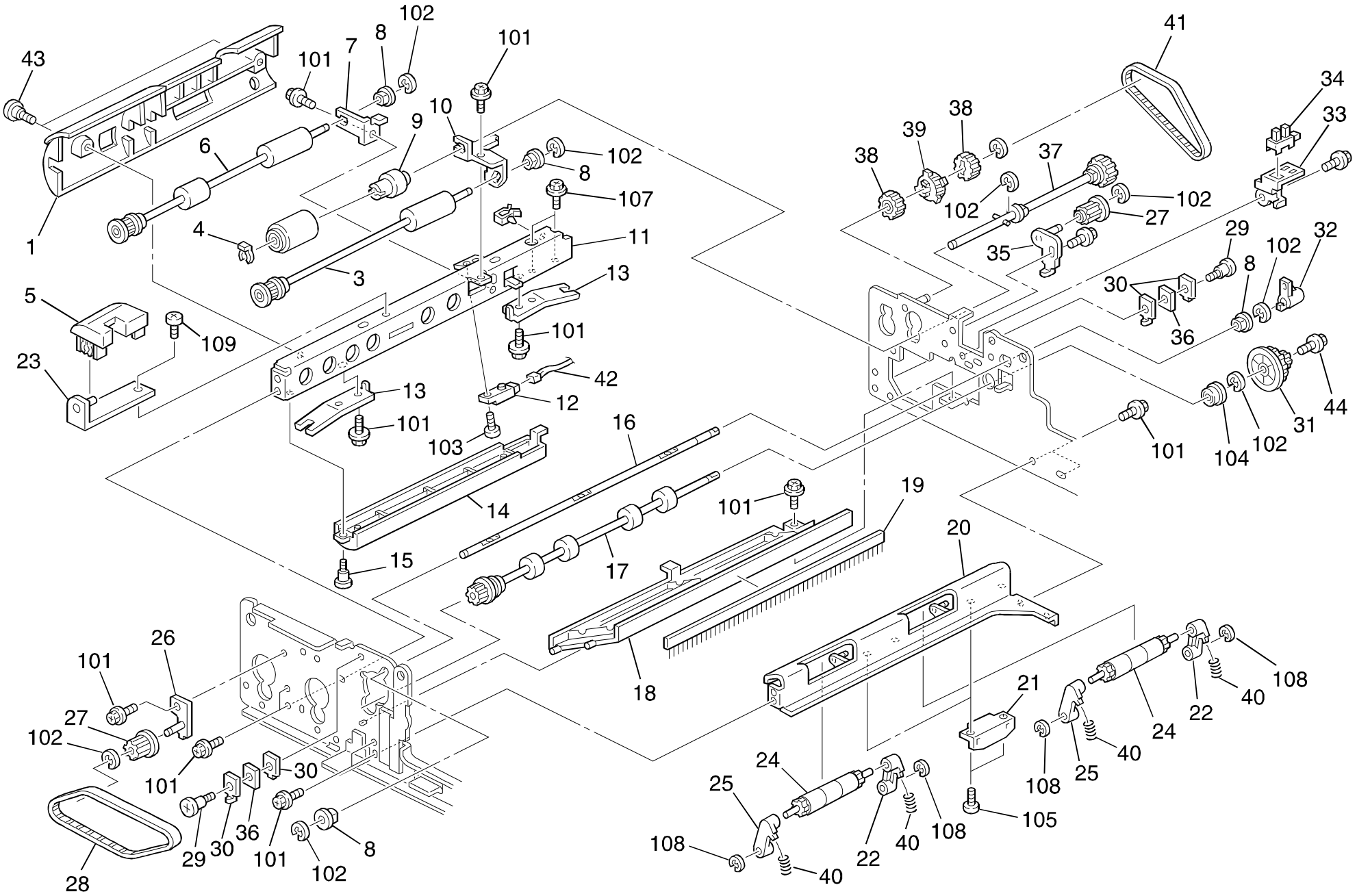


6.Original Feed section (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A628 1594	Left Transport Roller Holder	1
2	A628 1591	Left Transport Roller Shaft	1
3	A628 1592	Left Transport Roller	1
4	A628 1184	ShµFt - Pull Out Roller	1
5	A628 1181	Lower Right Stay	1
6	A628 1187	Lower Transport Guide	1
7	A628 1188	Seal - Lower Transport Guide	1
8	AW02 0075	Photointerrupter	4
9	A628 1161	Upper Stay	1
10	A628 1851	Feed-in Clutch Ass'y	1
11	A628 1855	Feed-in Clutch Bracket	1
12	5053 0447	Bushing - 6mm	1
13	A628 1595	Spring Holder	1
14	A628 1596	Left Transport Roller Spring	1
15	A628 5735	Relay Harness - Original Width Sens	1
16	A628 1162	Separation Roller Guide	1
17	A628 1163	Cushion - Original Entrance Guide	1

Index No.	Part No.	Description	Q'ty Per Assembly
101	0720 0040B	Retaining Ring - M4	
102	0720 0060B	Retaining Ring - M6	
103	0632 0100	Parallel Pin - M2x10	
104	0720 0025E	Retaining Ring - M2.5	
105	0451 3006B	Tapping Screw - M3x6	
106	0807 5066	Washer - M8.1x14x0.3	
107	0807 4072	Washer - Core	
108	1105 0283	Clamp	
109	0453 3006B	Tapping Screw - M3x6	

7.Original Exit Section (G405)

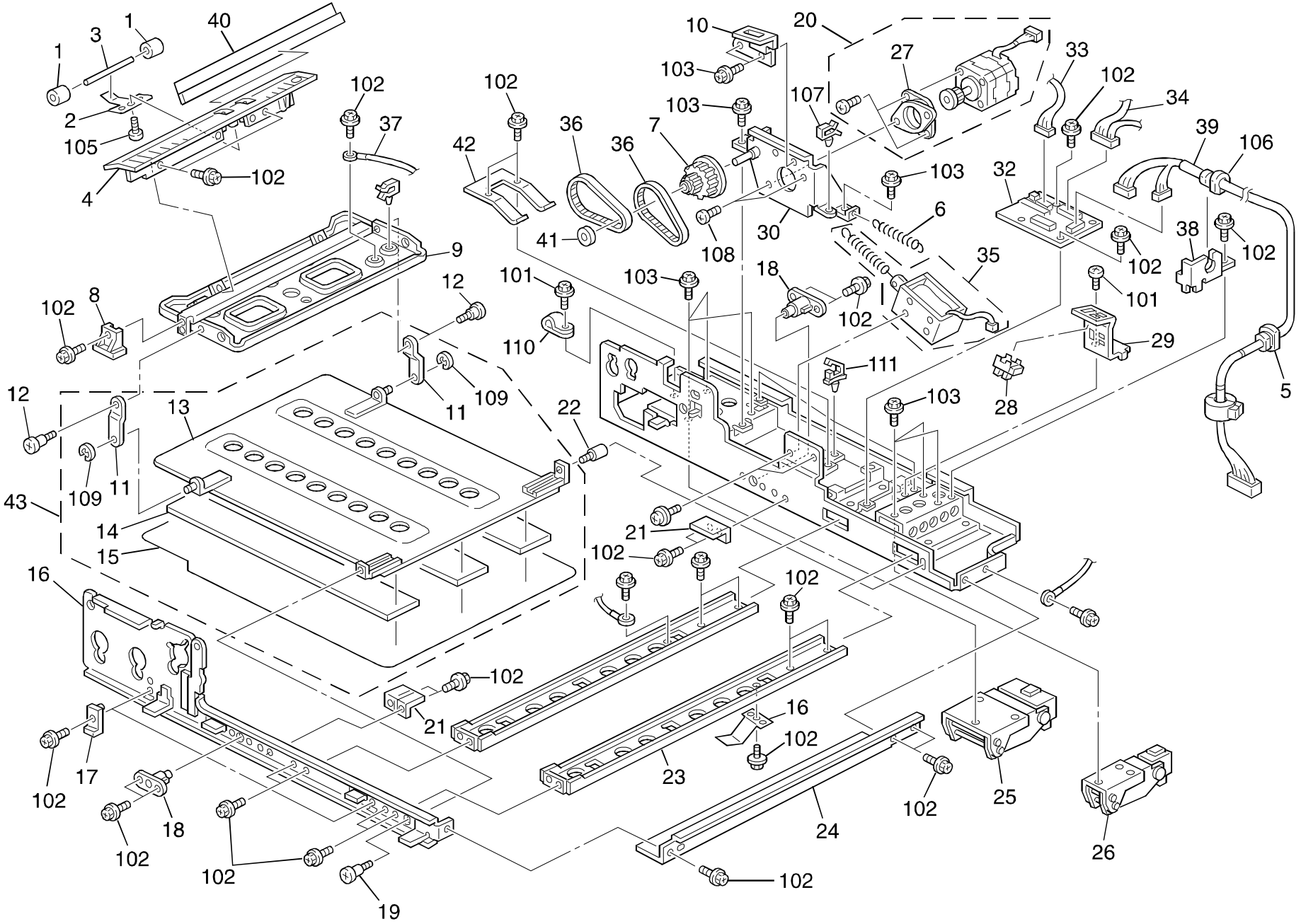


7.Original Exit Section (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A628 1541	Pull Out Guide	1
2	A628 1149	Separation Guide	1
3	A628 1562	Right Transport Roller	1
4	5447 2681	Snap Ring	1
5	A628 1157	Guide - Separation	1
6	A628 1542	Turn Guide Plate - Right	1
7	A628 1147	Brracket - Pull Out Roller	1
8	5053 0447	Bushing - 6mm	4
9	A134 2885	Torque Limitter	1
10	A628 1142	Bracket - Feed Roller	1
11	A628 1141	Left Stay	1
12	AW01 0066	Photosensor - PS-R50D1-B	1
13	A628 1144	Spring Plate - Guide - Expo Glass	2
14	A628 1551	Original Guide - DF Exposure Glass	1
15	AA14 3051	Shoulder Screw - M4	1
16	A628 1239	Shaft - Original Stopper	1
17	A628 1563	Upper Exit Roller	1
18	A628 1561	Upper Exit Guide	1
19	AA12 0032	Antistatic Brush	1
20	A628 1574	Lower Exit Guide	1
21	5936 2480	Magnet Catch Ass'y	1
22	A628 1566	Rear Bushing - Exit Roller	2
23	A628 1165	Bracket - Guide	1
24	A628 1585	Lower Exit Roller	2
25	A628 1565	Front Bushing - Exit Roller	2
26	A628 1136	Belt Tightener	1
27	A628 1837	Pulley - 20T	2
28	A628 1834	Timing Belt - 220mm	1
29	A628 1121	Stepped Screw - M4	2
30	A628 1119	Magnet Holder	4
31	A628 1833	Pulley - T42/T20	1
32	A628 1238	Lever - Original Stopper	1
33	A628 1117	Bracket - Cover Sensor	1
34	AW02 0075	Photointerrupter	1
35	A628 1126	Belt Tightener	1

Index No.	Part No.	Description	Q'ty Per Assembly
36	A607 2176	Exit Cover Magnet	2
37	A628 1515	Drive Shaft - Separation Roller	1
38	A628 1836	Gear - 20Z	2
39	A628 1835	Pulley - 30T	1
40	G010 1106	Exit Roller Spring	4
41	A628 1838	Timing Belt - 200mm	1
42	A628 5740	Relay Harness - Registration Sensor	1
43	5447 2769	Stepped Screw	2
44	A590 2214	Screw - M3X5	1
101	0451 3006B	Tapping Screw - M3x6	
102	0720 0040B	Retaining Ring - M4	
103	0313 0100B	Philips Pan Head Screw - M3x10	
104	0741 3506	Ball Bearing - 6x12x4 mm	
105	0353 0060B	Philips Pan Head Screw - M3x6	
106	5447 2769	Stepped Screw	
107	0451 4006B	Tapping Screw - 4x6	
108	0720 0030B	Retaining Ring - M3	
109	0453 3006B	Tapping Screw - M3x6	

8.DF Electrical Section (G405)



8.DF Electrical Section (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
1	A628 1587	Right Transport Roller	2
2	A628 1586	Plate Spring - Lower Transport Guid	1
3	A628 1588	Right Transport Roller Shaft	1
4	A628 1521	Lower Exit Guide	1
5	A628 5803	Cord Bushing	1
6	A628 1229	Tension Spring - Stepper Motor	1
7	A628 1831	Pulley - 42T/20T	1
8	A628 1532	Knob - Release Lever	1
9	A628 1523	Bracket - Platen Cover	1
10	A628 1123	Sensor Bracket	1
11	A628 1624	Link - Original Holder Bracket	2
12	C200 3115	Shoulder Screw - Sensor Actuator	2
13	A628 1613	Original Holder Bracket	1
14	A628 1614	Original Holder Pad	3
15	A628 1626	Original Holder Sheet	1
16	A628 1153	Grounding Plate	2
17	A628 1139	Stopper Plate	1
18	A628 1529	Stud - Platen Cover	2
19	AA14 3307	Stepped Screw - M3x4	1
20	A628 1822	DF Main Motor - DC 7W	1
21	A628 1122	Support Bracket - Platen Sheet	2
22	A499 2389	Slider Guide Screw	1
23	A628 1151	Middle Stay	2
24	A628 1152	Right Stay	1
25	A628 1172	Left Hinge Ass'y	1
26	A628 1171	Right Hinge Ass'y	1
27	A548 2113	Motor Cushion	1
28	AW02 0075	Photointerrupter	2
29	A628 1129	Bracket - DF Position Sensor	1
30	A628 1825	Bracket - DF Main Motor	1
31	A628 5802	Harness - DF Interface	1
32	A628 5500	DF Control Board	1
33	A628 5720	Harness - DF Main Motor	1
34	A628 5810	Harness - Sensor	1
35	A628 1231	Feed Belt Solenoid	1

Index No.	Part No.	Description	Q'ty Per Assembly
36	A628 1832	Timing Belt - 142mm	2
37	A628 5745	Grounding Wire	1
38	A628 1154	Bracket - Harness Clamp	1
39	A628 1536	Stamper Holder Plate	1
40	A628 1517	Guide - Exit	1
41	A628 1829	Collar - 9 X 15 X 3	1
42	A628 1176	Grounding Plate - Base	1
43	A628 1602	Original Holder Sheet Ass'y	1
101	0314 0060B	Philips Pan Head Screw - M4x6	
102	0451 3006B	Tapping Screw - M3x6	
103	0451 4006B	Tapping Screw - 4x6	
104	0313 0040B	Philips Pan Head Screw - M3x4	
105	0452 3008B	Tapping Screw - M3x8	
106	1105 0022	Cord Stopper - Awg 18/16 Ul	
107	1105 0200	Clamp	
108	0313 0060B	Philips Pan Head Screw - M3x6	
109	0720 0030E	Retaining Ring - M3	
110	1105 0176	Nylon Clamp	
111	1105 0310	Wire Clamp	

9.SIU Board (G405)

AR

SYMBOL NO.	INDEX NO.
AR 1	111
AR 2	111
AR 3	111
AR 4	111
AR 5	111
AR 6	111
AR 7	111
AR 8	111
AR 9	111
AR10	111

CAPACITOR

SYMBOL NO.	INDEX NO.
C 1	115
C 2	116
C 3	117
C 4	----
C 5	116
C 6	----
C 7	----
C 8	----
C 9	----
C10	119

SYMBOL NO.	INDEX NO.
C11	119
C12	119
C13	118
C14	119
C15	118
C16	119
C17	119
C18	118
C19	118
C20	119

SYMBOL NO.	INDEX NO.
C21	119
C22	119
C23	119
C24	119
C25	119
C26	118
C27	119
C28	118
C29	119

CNNECTOR

SYMBOL NO.	INDEX NO.
CN 1	103
CN 2	102
CN 3	102

DIODE

SYMBOL NO.	INDEX NO.
DI 1	105

FUSE

SYMBOL NO.	INDEX NO.
FU 1	104

FILTER

SYMBOL NO.	INDEX NO.
FIL1	104

IC

SYMBOL NO.	INDEX NO.
IC 1	120
IC 2	120
IC 3	1
IC 4	107
IC 5	108
IC 6	110
IC 7	109
IC 8	106
IC 9	107
IC10	109

JP

SYMBOL NO.	INDEX NO.
JP 1	122
JP 2	114
JP 3	114
JP 4	113
JP 5	114
JP 6	114
JP 7	114

LED

SYMBOL NO.	INDEX NO.
LED 1	----

RESISTOR

SYMBOL NO.	INDEX NO.
R 1	113
R 2	113
R 3	113
R 4	113
R 5	113
R 6	----
R 7	113
R 8	113
R 9	112
C10	113

SYMBOL NO.	INDEX NO.
R11	113
R12	113
R13	113
R14	113
R15	113
R16	113
R17	113
R18	113
R19	113
R20	113

SYMBOL NO.	INDEX NO.
R21	113
R22	112
R23	113
R24	113
R25	113
R26	113
R27	113
R28	113
R29	113
R30	113

9.SIU Board (G405)

RESISTOR

SYMBOL NO.	INDEX NO.
C31	113
C32	113
C33	113
C34	113
C35	113
C36	113
C37	113
C38	113
C39	112
C40	113

SYMBOL NO.	INDEX NO.
C41	112
C42	112
C43	113
C44	113

TP

SYMBOL NO.	INDEX NO.
TP 1	121
TP 2	121

9.SIU Board (G405)

Index No.	Part No.	Description	Q'ty Per Assembly
*	G405 5801	PCB SIU	
1	G404 5950	IC - M60054-0216FP	

Index No.	Part No.	Description	Q'ty Per Assembly
102	1102 7032	Connector - 5-179583-4	
103	1102 7247	Connector - 176378-4	
104	1107 0722	Fuse - K19374/1.6a	
105	1402 1171	Diode - 3GWJ42	
106	1407 1880	TTLIC - SN74LS04NS	
107	1407 2130	TTLIC - 74F08SJ	
108	1407 2134	TTLIC - 74F32SJ	
109	1407 2135	TTLIC - 74F74SJ	
110	1407 4689	LSI - SCSI Cont. - SYM53CF9	
111	1601 7805	Resistor Array - 33 Ω ±5	
112	1630 4103	Resistor - 10K Ω ±5% 1/16	
113	1630 4330	Resostor - 33 Ω ±5% 1/8w	
114	1634 0000	Registor - 0 Ω - 1/16w	
115	1642 2470	Capacitor - 47µF ±20% 25V	
116	1643 0100	Capacitor - 10µF ±20% 10V	
117	1660 2220	Capacitor - 22PF ±20% 35V	
118	1660 4102	Capacitor:1000pf:±10%:50v	
119	1660 8104	Capacitor - 0.1µF +80-20% 2	
120	1901 0023	Dram - 4m - 256x16 - 70ns	

10.SCU Board (G405)

AR

SYMBOL NO.	INDEX NO.
AR 1	143
AR 2	143
AR 3	139
AR 4	139
AR 5	139
AR 6	141
AR 7	141
AR 8	141
AR 9	141
AR10	141

SYMBOL NO.	INDEX NO.
AR11	141
AR12	139
AR13	139
AR14	139
AR15	139
AR16	140
AR17	140
AR18	140
AR19	140
AR20	141

SYMBOL NO.	INDEX NO.
AR21	141
AR22	139
AR23	139
AR24	140
AR25	140
AR26	140
AR27	142
AR28	142
AR29	142
AR30	142

SYMBOL NO.	INDEX NO.
AR31	142
AR32	140
AR33	140
AR14	140
AR35	141
AR36	138
AR37	138

CAPACITOR

SYMBOL NO.	INDEX NO.
C 1	174
C 2	176
C 3	165
C 4	173
C 5	176
C 6	176
C 7	165
C 8	174
C 9	176
C10	165

SYMBOL NO.	INDEX NO.
C11	164
C12	172
C13	166
C14	168
C15	----
C16	165
C17	176
C18	176
C19	173
C20	176

SYMBOL NO.	INDEX NO.
C21	173
C22	176
C23	168
C24	172
C25	165
C26	----
C27	----
C28	174
C29	176
C30	173

CAPACITOR

SYMBOL NO.	INDEX NO.
C31	176
C32	176
C33	173
C34	----
C35	----
C36	163
C37	161
C38	162
C39	161
C40	163

SYMBOL NO.	INDEX NO.
C41	163
C42	176
C43	174
C44	176
C45	176
C46	176
C47	176
C48	173
C49	173
C50	169

SYMBOL NO.	INDEX NO.
C51	176
C52	173
C53	169
C54	176
C55	173
C56	176
C57	173
C58	176
C59	174
C60	174

SYMBOL NO.	INDEX NO.
C61	174
C62	----
C63	----
C64	176
C65	----
C66	----
C67	172
C68	172
C69	172
C70	172

SYMBOL NO.	INDEX NO.
C71	172
C72	172
C73	172
C74	172
C75	175
C76	174
C77	175
C78	175
C79	174
C80	175

SYMBOL NO.	INDEX NO.
C81	174
C82	176
C83	175
C84	174
C85	176
C86	173
C87	168
C88	173
C89	176
C90	167

SYMBOL NO.	INDEX NO.
C91	167
C92	167
C93	167
C94	172
C95	172
C96	171
C97	168
C98	173
C99	176
C100	176

10.SCU Board (G405)

CAPACITOR

SYMBOL NO.	INDEX NO.
C101	176
C102	168
C103	168
C104	168
C105	----
C106	168
C107	----
C108	170
C109	167
C110	167

SYMBOL NO.	INDEX NO.
C111	176
C112	173
C113	176
C114	173
C115	176
C116	176
C117	173
C118	176
C119	173
C120	172

SYMBOL NO.	INDEX NO.
C121	168
C122	172
C123	168
C124	176
C125	173
C126	172
C127	168
C128	172
C129	168
C130	171

SYMBOL NO.	INDEX NO.
C131	168
C132	----
C133	176
C134	173
C135	174 176
C136	----
C137	----
C138	----
C139	----
C140	176

SYMBOL NO.	INDEX NO.
C141	173
C142	176
C143	176
C144	176
C145	176
C146	173
C147	174
C148	176
C149	168
C150	----

SYMBOL NO.	INDEX NO.
C151	176
C152	173
C153	----
C154	----
C155	----
C156	----
C157	----
C158	----
C159	----
C160	----

SYMBOL NO.	INDEX NO.
C161	----
C162	----
C163	176
C164	176
C165	176
C166	176
C167	176
C168	176
C169	173
C170	176

CAPACITOR

SYMBOL NO.	INDEX NO.
C171	173
C172	176
C173	173
C174	----
C175	174
C176	173
C177	176

CNNECTOR

SYMBOL NO.	INDEX NO.
CN 1	----
CN 2	105
CN 3	106
CN 4	108
CN 5	109
CN 6	107
CN 7	102
CN 8	104
CN 9	103
CN10	110

SYMBOL NO.	INDEX NO.
CN11	----

FILTER

SYMBOL NO.	INDEX NO.
FIL 1	----
FIL 2	----
FIL 3	----
FIL 4	----
FIL 5	----
FIL 6	----
FIL 7	----
FIL 8	----
FIL 9	----
FIL10	----

IC

SYMBOL NO.	INDEX NO.
IC 1	2
IC 2	125
IC 3	178
IC 4	131
(Socket)	112
IC 5	133
IC 6	128
IC 7	122
IC 8	132
IC 9	120
IC10	132

SYMBOL NO.	INDEX NO.
IC11	1
IC12	177
IC13	125
IC14	132
IC15	132
IC16	177
IC17	177
IC18	125
IC19	127
IC20	135

SYMBOL NO.	INDEX NO.
IC21	119
IC22	121
IC23	119
IC24	119
IC25	119
IC26	119
IC27	119
IC28	134
IC29	123
IC30	130

10.SCU Board (G405)

IC

SYMBOL NO.	INDEX NO.
IC31	----
IC32	119
IC33	129
IC34	119
IC35	119
IC36	119
IC37	119
IC38	119
IC39	124

JP

SYMBOL NO.	INDEX NO.
JP 1	159
JP 2	159
JP 3	156
JP 4	156
JP 5	159
JP 6	156
JP 7	156
JP 8	156
JP 9	156
JP10	156

SYMBOL NO.	INDEX NO.
JP11	156
JP12	156
JP13	156
JP14	156
JP15	159
JP16	159
JP17	159
JP18	----
JP19	159
JP20	159

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1	G404 5960	IC - UPD65664GN-092-LMU	
2	G405 5710	Programmed Rom:scu	

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103	1102 4623	Ct Connector - 6p	
104	1102 6306	Connector - 13p	
105	1102 6515	Connector - 34p	
106	1102 6540	Connector - 80 Pin	
107	1102 6595	Connector - 11p	
108	1102 6811	Connector	
109	1102 7389	Connector - Fh12-50s-0.5sv	
110	1102 7642	Connector - 787202-1	
111	1104 0612	Connector - 40p	
112	1104 0679	IC Socket - 8P DILB8P-8J	
114	1204 2321	Dip Sw - Disp8nb-1	
115	1204 2352	Rotary Switch - Drr4110	
116	1204 2361	Knob - Switch - Md0050798	
117	1204 2447	Push Sw - Skhhlu	
118	1402 1327	Diode 2.0V	
119	1407 1600	TTLIC - SN74LS244NS	
120	1407 1741	TTL - SN74LS32NS	
121	1407 1880	TTLIC - SN74LS04NS	
122	1407 2077	TTLIC - SN74LS138NS	
123	1407 2081	TTLIC - SN74LS08NS	
124	1407 2143	TTLIC - 74F244SJ	
125	1407 2187	TTLIC - SN74LS07NS	
126	1407 2231	IC - TD62308AF	
127	1407 2247	TTL - SN74LS164NS	
128	1407 2746	IC - CXD1095Q	
129	1407 2976	TTLIC - SN74LS245NS	
130	1407 3764	IC - TC7SU04F	
131	1407 4304	IC - EEPROM-BR93LC46A	
132	1407 4341	FIFO	
133	1407 4461	IC - HD6413003F-12	
134	1408 0611	IC - 3771	
135	1408 1225	IC - STK672-040	
136	1503 0607	Crystal Oscilator - 24.0mhz	
137	1503 0767	Oscilator - 15.781754mhz	

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139	1601 7801	Resistor Array:10kΩ:±5%:	
140	1601 7804	Resistor Array - 0 Ω 1/16	
141	1601 7805	Resistor Array - 33 Ω ±5	
142	1601 7806	Registor Array - 68Ω ±5%	
143	1601 7807	Registor Array -3.3k Ω -5	
144	1630 4100	Resistor - 10 Ω ±5% 1/16	
145	1630 4101	Resistor - 100 Ω ±5% 1/1	
146	1630 4102	Resistor - 1.0KΩ ±5% 1/1	
147	1630 4103	Resistor - 10KΩ ±5% 1/16	
148	1630 4104	Resistor - 100 Ω ±5% 1/1	
149	1630 4105	Resistor - 1.0MΩ ±5% 1/1	
150	1630 4151	Registor - 150 Ω ±5% 1/1	
151	1630 4201	Registor - 200 Ω - ±5% -	
152	1630 4330	Resostor - 33Ω ±5% 1/8w	
153	1630 4471	Resistor - 470 Ω ±5% 1/1	
154	1630 4472	Resistor - 4.7KΩ ±5% 1/1	
155	1630 4680	Resistor - 68 Ω ±5% 1/16	
156	1634 0000	Registor - 0Ω - 1/16w	
157	1634 1001	Resistor - 1KΩ ±5% 1/16W	
158	1634 1501	Registor - 1.50k Ω - ±1%	
159	1634 4700	Registor - 470Ω ±1% 1/16	
160	1634 4701	Registor - 4.70Ω ±1% 1/1	
161	1640 5101	Capacitor - 100µF ±20% 50V	
162	1642 2101	Capacitor - 100 Ω ±20% 2	
163	1642 2470	Capacitor - 47µF ±20% 25V	
164	1642 5109	Capcitor - 1µF - ±20% - 50	
165	1643 0100	Capacitor - 10µF ±20% 10V	
166	1660 2101	Capacitor - 100pf - ±10% -	
167	1660 2120	Capacitor:12pf:±5%:50v	
168	1660 2220	Capacitor - 22PF ±20% 35V	
169	1660 2270	Capacitor - 27PF ±20% 35V	
170	1660 2331	Capacitor - 330PF ±5% 50V	

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172	1660 2680	Capacitor - 68PF ±5% 50V	
173	1660 4102	Capacitor:1000pf:±10%:50v	
174	1660 6103	Capacitor - 10000pf - +80%-	
175	1660 7104	Capacitor - 100000PF 50V	
176	1660 8104	Capacitor - 0.1µF +80-20% 2	
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